PB90-234550

Final Response to BDAT Related Comments Document D005 Characteristic Wastes for Barium, and P013 and D006 Characteristic Wastes for Cadmium. Volume 1-F

(U.S.) Environmental Protection Agency, Washington, DC

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U.S. Department of Commerce
National Technical Information Service
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FINAL
RESPONSE TO BDAT RELATED COMMENTS DOCUMENT

D005: Characteristic Wastes for Barium, and P013
and
D006: Characteristic Wastes for Cadmium

VOLUME I-F

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INTRODUCTION

This response to comments document only addresses those comments which were submitted on the proposed land disposal restrictions for those waste codes and general BDAT technologies and issues which relate to Third Third Wastes Treatment Standards.

The commenters presented in this document are grouped according to major concerns of the commenters. This document is comprised of the following sections:

ISSUE CODE 1: General BDAT Aspects
ISSUE CODE 2: D001 - Characteristic Ignitable Wastes
ISSUE CODE 3: D002 - Characteristic Corrosive Wastes
ISSUE CODE 4: D003 - Characteristic Reactive Wastes and P and U Wastes Containing Reactive Listing Constituents
ISSUE CODE 5: D004/D010 - Characteristic Wastes for Arsenic and Selenium and K, P, and U Wastes Containing Arsenic and Selenium
ISSUE CODE 6: D005 - Characteristic Wastes for Barium and P013
ISSUE CODE 7: D006 - Characteristic Wastes for Cadmium
ISSUE CODE 8: D007 - Characteristic Wastes for Chromium
ISSUE CODE 9: D008 - Characteristic Wastes for Lead P and U Wastes Containing Lead
ISSUE CODE 10: D009 - Characteristic Wastes for Mercury P and U Wastes Containing Mercury
ISSUE CODE 11: K044, K045, K047: Wastes from the Manufacturing and Processing of Explosives
ISSUE CODE 12: D011 - Characteristic Wastes for Silver
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16. Abstract (Limit: 200 words)

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The commenters presented in this document are grouped according to major concerns of the commenters.

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OPTIONAL FORM 272 (4-77)
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ISSUE CODE 24: K011/K013/K014 - Acrylonitrile

ISSUE CODE 25: K015 - Still Bottoms from Benzal Chloride

ISSUE CODE 26: K021 - Spent Antimony Catalyst.

(No Comments Were Received for this Waste Code)

ISSUE CODE 27: K046 - WW Treatment Sludges from Manufacturing, Formulating, and Loading of Lead-Based Initiating Compounds

ISSUE CODE 28: K060 - Ammonia Still Lime Sludge.

(No Comments Were Received for this Waste Code)

ISSUE CODE 29: K061 - Electric Arc Furnace Dust

ISSUE CODE 30: K069 - Emission Control Dust/Sludge from Secondary Lead Smelting

ISSUE CODE 31: K071, K106 - Mercury Cell Process Wastes

ISSUE CODE 32: K073 - Chlorinated Hydrocarbon Wastes.

(No Comments Were Received for this Waste Code)

ISSUE CODE 33: K086 - Residues from Ink Formulation

ISSUE CODE 34: K100 - Waste Leaching Solution from Acid Leaching of Emission Control Dust/Sludge from Secondary Lead Smelting

(No Comments Were Received for this Waste Code)

ISSUE CODE 35: Wastes Containing Cyanide

ISSUE CODE 36: K017 - Wastes from the production of Epichlorohydrin

(No Comments Were Received for this Waste Code)

ISSUE CODE 37: K028,K029, K095, K096 - Production of 1,1,1-Trichloroethane

ISSUE CODE 38: Wastewaters containing BDAT Constituents

ISSUE CODE 39: K022 - Wastes from the Production of Phenol/Acetone

ISSUE CODE 40: K025 - Distillation Bottoms from the Production of Nitrobenzene

ISSUE CODE 41: K035 - WW Treatment Sludges from the Production of Creosote

ISSUE CODE 42: K026 - Stripping Still Tails from the Production of Methyl Ethyl Pyridine

(No Comments Were Received for this Waste Code)

ISSUE CODE 43: K083 - Distillation Bottoms from the Production of Aniline

ISSUE CODE 44: Oxygenated Hydrocarbons and Heterocyclic U and P Wastes

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Commenters are identified by both commenter number and commenter name. Comments within each section of this document have been assigned a sequential comment number.

Issues were obtained from the original comment submittal and were categorized based on the grouping specified above. The Agency's response to each comment follows immediately after the text of the document. For responses related to capacity issues, the reader should review the "Response to Comments Background Document for the Third Third Land Disposal Restrictions Proposed Rule, November 22, 1989. Volume II Capacity Related Comments." For information regarding broad policy questions, the reader is directed to the "Response to Comments Background Document for the Third Third Land Disposal Restrictions Proposed Rule, November 22, 1989. Volume III Policy Related Comments."

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No Comments Were Received for this Waste Code

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ISSUE CODE 6:D005 - Characteristic Wastes for Barium and P013

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Comment Number: 6-A-1

Docket Number: LD12-00050

Commenter: HWTC

Issue: Barium

Subissue: Data Submission

Comments:

The submission presents data on the stabilization of barium wastes. Seventeen data points are given ranging from .199 to 12.32 mg/l TCLP in the treated wastes.

Response:

In this data submission only two data points were used suitable to use to calculate a treatment standard. The remaining data points were unsuitable because no untreated waste TCLP values were given. Thus, there is no way to tell if treatment occurred.

The two suitable data points were used though in the calculation of the treatment standard for P013, barium cyanide. These data were not used in the calculation of the D005 treatment standard, however, because the treatment standard was set at the characteristic level due to the diverse nature of all D005 wastes.

Comment Number: 6-A-2
Docket Number: LD12-00067
Commenter: HWTC
Issue: Barium
Subissue: Data Submission
Comments:

These data were a supplemental submission to the previous HWTC data (LD12-00050). This submission presented data on the stabilization of barium wastes using proprietary reagents. The stabilized values range from 0.883 to 19.8 mg/l TCLP.

Response:

These data were used in the calculation of the treatment standard because the treated waste (stabilized) TCLP concentrations are given along with the untreated TCLP concentrations. In the calculation, however, only those data with untreated values above the characteristic level were used (along with corresponding stabilized TCLP concentrations). The treatment standard for P013, barium cyanide, was based on these data. The data were not used in the calculation of the treatment standard for D005 because the treatment standard was set at the characteristic level.

Comment Number: 6-A-3

Docket Number: LD12-00094A

Commencer: TRICIL

Issue: Barium

Subissue: Data Submission

Comments:

Data are presented in this submission showing stabilization of barium wastes. The treated (stabilized) concentrations range from 0.06 to 3.22 mg/l EP toxicity.

Response:

The data from this submission were not used in the calculation of a treatment standard because the untreated waste EP concentrations corresponding to the treated values were not given. However, if a standard were calculated from these data it would have been 3.6 (mg/l) EP.

Comment Number: 6-A-4

Docket Number: LD12-00159

Commenter: WMI

Issue: Barium

Subissue: Data Submission

Comments:

The data submission presents data on the stabilization of barium. The treated waste (stabilized) concentrations range from 0.26 to 561 mg/l TCLP for 3 data points.

Response:

The data from this submission were not used because no untreated waste TCLP concentrations were given corresponding to the treated TCLP values. Also, the treated waste values differ by 3 orders of magnitude with no explanation given. However, if a standard were calculated from these data it would have been 90,400 (mg/l)TCLP. The reason the standard would have been this high is because of an exceedingly high variability of the data.

Comment Number: 6-A-5
Docket Number: LD12-00213B
Commenter: VISION-EASE
Issue: Barium
Subissue: Data Submission
Comments:

The data submission presents data on the solidification of glass solids containing barium.

Response:

The data from this submission were not used in the calculation of the treatment standard because there were no untreated waste TCLP concentrations given corresponding to the treated values. However if a standard were calculated from these data, it would have been 320 (mg/l) EP.

Comment Number: 6-B-1

Docket Number: LD12-00094

Commenter: Tricil

Issue: Barium

Subissue: Treatment Standard

Comment:

However, as a technical issue TESI also believes that U.S. EPA has over looked an effective treatment method for barium wastes. Specifically, TESI believes that the use of phosphoric acid and subsequent precipitation as a phosphate produces a more insoluble form of barium than precipitation as a carbonate. Consequently, TESI urges U.S. EPA to include this treatment option as an alternative.

Comment Number: 6-B-1

Docket Number: LD12-00094

Commenter: Tricil

Issue: Barium

Subissue: Treatment Standard

Response:

The EPA has chosen to set numerical standards rather than required methods of treatment for D005 and P013 wastewaters. Consequently the commenter may use any method, including phosphate precipitation, to achieve the concentration-based standard.

V

Comment Number: 6-B-2
Docket Number: LD12-00148
Commenter: CPC
Issue: Barium
Subissue: Treatment Standard
Comment:

Under this heading at page 48,435, EPA proposes, "Acid or water leaching followed by chemical precipitation as sulfate or carbonate or stabilization as methods of treatment". CPC assumes that stabilization is an alternative rather than an additional treatment, although in the discussion of BDAT for Nonwastewaters, the term "followed by stabilization" suggests that both precipitation and stabilization are required after leaching. The following discussion will show that sulfate treatment alone will render D005 Nonwastewaters harmless and safe for land disposal, that prior leaching is unnecessary, and that stabilization is appropriate only as an alternative to sulfate precipitation.

Based on CPC's knowledge and experience, it is our opinion that sulfate precipitation is clearly the method of choice for the treatment of D005 wastes which are classified as hazardous under the EP toxicity characteristic test. Barium sulfate is not only the most insoluble of barium compounds (See Table 1), but it is insoluble in all aqueous media, acidic, alkaline, and neutral. Any other barium compound in contact with soluble sulfate in an aqueous medium will be converted to barium sulfate. Because of its high degree of insolubility, barium sulfate, when disposed of in a landfill, will remain in place even when exposed to contact with rainfall, surface water, or groundwater. The existence in nature of countless deposits of Barite ore (barium sulfate) in all types of geological settings throughout the world, attests to this.

Because of its high degree of insolubility, barium sulfate is inert, non-toxic, and, therefore, completely safe for disposal. This is confirmed in the following statement from the American Conference of Governmental Industrial Hygienists (ACGIH) in their publication, Documentation of Threshold Limit Values, 1987 (Ref. 1): "Barium sulfate is characterized by its extreme insolubility and is therefore non-toxic to humans. It has not shown the strong stimulant effect on all forms of muscle characteristic of the soluble compounds. Because of its high radio opacity, it has been used as an opaque medium in X-ray examination of the gastrointestinal, respiratory, and urinary systems. It is also inert in the human lung, as has been demonstrated by its deliberate introduction into the bronchial tract as a contrast medium in bronchography and by industrial exposure to high concentrations of fine dust". Based on this evaluation, ACGIH has classified barium sulfate as a non-toxic nuisance dust with a Threshold Limit Value (TLV) of 10

Comment Number: 6-B-2 (cont.)
Docket Number: LD12-00148
Commenter: CPC
Issue: Barium
Subissue: Treatment Standard
Comment:

milligrams per cubic meter. All other barium compounds, including barium carbonate and barium hydroxide, have been assigned a TLV of 0.5 milligrams per cubic meter.

As to the requirement for acid or water leaching prior to treatment, the sulfate precipitation discussed above would be equally as effective without any prior leaching. By the introduction of a stoichiometric amount of soluble sulfate, all barium present in the waste will be tied up as insoluble, inert barium sulfate. Leaching prior to this treatment would serve no purpose to offset its additional cost.

CPC disagrees with EPA's proposal to include precipitation as carbonate as an alternate BDAT for D005 wastes. Although barium carbonate has very low solubility in water, it is over 10 times more soluble than barium sulfate (See Table 1). In addition, barium carbonate is readily soluble in acids, even weak acids, and under the conditions of the EP toxicity procedure will dissolve to the extent of the acetic acid available. A sample of neutral waste containing a small percent of barium carbonate, when subjected to the EP test can produce an extract containing over 5000 mg/l of soluble barium, 50 times the RCRA regulatory threshold of 100 mg/l.

Concerning EPA's proposal to include stabilization or solidification as BDAT for D005 wastes, although CPC has had no experience with this type of treatment, we believe that precipitation as sulfate would be a more effective, more permanent, and less costly means of treatment. Sulfate compounds suitable as treatment agents, for example sodium sulfate or calcium sulfate, are readily available, reasonable in cost, and easily applied. Under some circumstances, it is possible that stabilization would be an appropriate means of treatment; however, when sulfate precipitation is used, stabilization as an additional treatment for D005 wastes would not be necessary.

In summary, CPC recommends that the BDAT treatment standards for D005 nonwastewaters exclude the requirement for prior acid or water leaching, eliminate the option of chemical precipitation as carbonate, and be stated as follows: "Chemical precipitation as sulfate or stabilization as [illegible] treatment".

Comment Number: 6-B-2 (continued)
Docket Number: L012-00148
Commenter: CPC
Issue: Barium
Subissue: Treatment Standard
Comment:

In the subject Federal Register, EPA discusses the removal of barium from wastewater by precipitation as barium hydroxide. CPC believes this information to be misleading. Barium hydroxide is soluble in water to the extent of around 5.6% (44,800 mg/l as Ba) at ambient temperatures (See Table 1). Although the solubility can be suppressed somewhat by a large excess of hydroxyl ion, the resulting "precipitate" would remain highly water soluble and further treatment with sulfate would have to be employed. Sulfate precipitation to begin with would clearly be the preferred method of treatment.

Comment Number: 6-B-2 (continued)
Docket Number: L012-00148
Commenter: CPC
Issue: Barium
Subissue: Treatment Standard
Comment:

TABLE 1

SOLUBILITIES OF SELECTED BARIUM COMPOUNDS

From: Linke, W.F., Solubilities of Inorganic and Metal Organic Compounds, American Chemical Society, 1958.

Name of Compound	Formula	Solubility in H_2O 30C (Mg Ba/1)
Barium Sulfate	$BaSO_4$	1.7 [illegible]
Barium Carbonate	$BaCO_3$	24
Barium Hydroxide	$Ba(OH)_2$	44,800

Comment Number: 6-B-2
Docket Number: LD12-00148
Commenter: Chemical Products Corp.
Issue: Barium
Subissue: Treatment Standard
Response:

The discussion of barium hydroxide in the proposed preamble was included to demonstrate how barium differs from other cationic BDAT-list metals in wastewaters. Other cationic metals are typically precipitated in hydroxide form; however, as the commenter points out, precipitation of barium in the sulfate form is less soluble. The proposed treatment standard was not based on the performance of precipitation as a hydroxide.

The final approach for setting treatment standards for D005 wastes, however, renders the commenter's concerns about precipitating reagents moot. The Agency has chosen to set a concentration-based treatment standard rather than a required method of treatment for D005 wastes. Consequently, the commenter may use any reagent for the precipitation of D005 wastewaters, as long as the level of barium in the treatment residue is less than 100 mg/l.

Comment Number: 6-B-3
Docket Number: L012-00159
Commenter: WMI
Issue: Barium
Subissue: Treatment Standard
Comment:

EPA has solicited comments on whether it should specify particular reagents for precipitation of toxic metals. WMI opposes this approach because it would rob treatment facilities of the flexibility necessary to treat wastes containing more than one metal and would not be suitable for commercial-scale treatment operations.

First, EPA asks whether it should specify sulfate as the sole precipitating reagent permitted for treatment of wastewaters that are EP toxic for barium (D005). 54 Fed. Reg. at 48,34. WMI believes that the choice of precipitating agent should be left to the treatment facility so long as the treatment standards are met. While direct precipitation of barium works well in the laboratory on a neutral solution with a high barium content, it is not practical for large scale commercial waste treatment.

Comment Number: 6-B-3 (cont.)
Docket Number: L012-00159
Commenter: WMI
Issue: Barium
Subissue: Treatment standard
Comment:

At a commercial wastewater treatment facility, wastewaters, which are generally received in 1-10 drum quantities, are combined to create a 6,000 gallon process batch, which contains a variety of metals requiring treatment. It is simply not practical or necessary to treat each metal separately and in sequence by a specified anion. Addition of a sulfate salt to an acid mixture would produce a corrosive liquid with a small amount (if any) of suspended barium salts that would be too corrosive to run through a filter press. Moreover, the quantity of solids produced would be inadequate for effective filtration. If sulfate were added before the addition of lime or other precipitating agents without an intervening filtration step, the resulting precipitate would be a mix of various barium salts and the goal of producing only barium sulfate would be not realized.

The separate treatment of barium-containing wastewaters is not a practical option. First, most barium-containing wastewaters also contain other metals. Second, the amount of wastewater containing only barium is too small to produce volumes suitable for commercial treatment. For these reasons, WMI believes that EPA should not specify sulfate as the sole permissible precipitating agent for barium-containing wastes, but should leave the choice of precipitating agent to the treatment facility.

Comment Number: 6-B-3

Docket Number: L012-00159.

Commenter: WMI

Issue: Barium

Subissue: Treatment Standard

Comment:

For these reasons, WMI believes that the Agency should not designate specific anions for the precipitation of specific metals. Because the restricted waste must meet all applicable standards, specifying reagents would add no increment of environmental protection. Instead, such a step would merely rob treatment facilities of the flexibility necessary to treat the endless variety of wastes produced in this nation.

Comment Number: 6-B-3
Docket Number: LD12-00159
Commenter: WMI
Issue: Barium
Subissue: Treatment Standard
Response:

The Agency agrees that specifying precipitating reagents may cause unnecessary problems for the treatment industry, in that typical waste streams often contain other metals for which a specified reagent is inappropriate. The final approach for setting treatment standards for D005 wastes, however, renders the commenter's concerns about precipitating reagents moot. The Agency has chosen to set a concentration-based treatment standard rather than a required method of treatment for D005 wastes. Consequently, the commenter may use any reagent for the precipitation of D005 wastewaters, as long as the level of barium in the treatment residue is less than 100 mg/l.

Comment Number: 6-B-4
Docket Number: L012-00159
Commenter: WMI
Issue: Barium
Subissue: Treatment Standard
Comment:

Many D005 wastes can be treated by stabilization to meet the standard of 1.5 mg/l without the need for the extraction and precipitation steps. For example, the Model City facility has had good success in stabilizing a waste stream containing barium chloride and other forms of soluble barium by treatment with sodium sulfate, followed by stabilization with gypsum and cement. This treatment reduced the leachable barium from > 5% to < 1 ppm (a copy of the analysis is provided as Attachment F). No separate acid or water leaching step was required and this type of treatment can be performed with the stabilization equipment currently available at commercial waste treatment facilities. Acid or water leaching, on the other hand, would require construction of specialized equipment. Moreover, the leaching tank and associated pumping equipment would have to have a high solids tolerance and would have to be very resistant to both corrosion (caused by acid) and erosion (caused by the high particulate level). Contrary to concerns expressed by EPA in the preamble, 54 Fed. Reg. at 48,434, the presence of excess soluble sulfate during treatment did not appear to adversely affect the stabilization. Ferrous sulfate is frequently added to wastes containing hexavalent chromium during stabilization treatment to reduce the leachable chromium levels and does not appear to interfere with the stabilization of barium.

Comment Number: 6-B-4
Docket Number: LD12-00159
Commenter: WMI
Issue: Barium
Subissue: Treatment Standard
Response:

The commenter seems confused by the proposed D005 treatment standards. It appears that the commenter is most concerned about the proposed nonwastewater treatment standard that was expressed as a required method of treatment, however, an allusion is made to meeting the standard of 1.5 mg/l. The Agency proposed a treatment standard of 1.15 mg/l for D005 wastewaters. It is assumed that the standard alluded to by the commenter was a typographical error. At any rate, when the Agency establishes a treatment standard expressed as a required method, as was done for D005 nonwastewaters, there is no subsequent requirement that the method perform to a specified concentration in the treatment residue. The waste must only be treated by the required method, then it may be land disposed.

The final approach for setting treatment standards for D005 wastes, however, renders the commenter's concerns about the treatment method moot. The Agency has chosen to set a concentration-based treatment standard rather than a required method of treatment for D005 nonwastewaters. Consequently, the commenter may use any method, including stabilization, as long as the level of barium in the treatment residue is less than 100 mg/l.

Comment Number: 6-B-5
Docket Number: L012-00172
Commenter: HWTC
Issue: Barium
Subissue: Treatment standard
Comment:

HWTC has submitted under separate cover data which support the establishment of a barium BDAT standard based upon stabilization.

In any case HWTC prefers a numerical limitation and has submitted data to support its establishment.

Comment Number: 6-B-5
Docket Number: LD12-00172
Commenter: HWTC
Issue: Barium
Subissue: Treatment Standard
Response:

Stabilization was proposed as an alternative method of treatment for D005 nonwastewaters. In today's final rule, however, the Agency has chosen to set a concentration-based treatment standard rather than a required method of treatment for D005 nonwastewaters. Consequently, the commenter may use any method, including stabilization, as long as the level of barium in the treatment residue is less than 100 mg/l.

The Agency acknowledges the data submission. The data available to EPA show that a treatment standard of 52 mg/l in the TCLP leachate is achievable for D005 nonwastewaters. The Agency recognizes, however, the diversity of wastes that qualify as hazardous under the D005 classification. Because of this diversity, EPA chose to regulate D005 nonwastewaters at the characteristic level of 100 mg/l in the TCLP leachate. Data that was received during the comment period support that even the most difficult to treat D005 wastes can be successfully treated to below this level.

Comment Number: 6-B-6

Docket Number: LD12-00179

Commenter: Dow

Issue: Barium

Subissue: Treatment standard

Comment:

Although surface precipitation is one method of stabilizing barium, many other technologies can be used. EPA is aware that some waste streams contain multiple listings. The D005 waste code has been routinely managed in Dow's incinerators. Often the waste is in the solid (non-wastewater) form. The burning of these wastes should continue to be allowed as long as the conditions in the incinerator permit are complied with.

Comment Number: 6-B-6

Docket Number: LD12-00179

Commenter: DOW

Issue: **Barium**

Subissue: **Treatment Standard**

Response:

The Agency has chosen to set a concentration-based treatment standard rather than a required method of treatment for D005 nonwastewaters. Consequently, the commenter may use any method, including incineration and stabilization, as long as the level of barium in the treatment residue is less than 100 mg/l. The Agency has expressed concern, however, that incineration may merely volatilize the metals or will merely concentrate them in the ash. The Agency is in the process of establishing regulations, outside of the land disposal restrictions, that will establish air emission standards for barium.

Comment Number: 6-B-7

Docket Number: L012-00210.

Commenter: American Standard

Issue: Barium

Subissue: Treatment Standard

Comment: Section III.A.5.C(1) specifically solicits comments on "…. data indicating the achievability of the concentration-based standards proposed in the following sections" (total composition 1.15mg/L barium maximum for any 24 hour composite sample).

In addition to being overly restrictive, we believe that this proposed standard cannot be met. The CRC Handbook of Chemistry and Physics, 60th Edition, 1979, p.p. B-58 & B-59 gives the following solubility data:

Substance	Temperature °C	Solubility in grams per 100cc
beta Barium Carbonate	18	0.0022
	100	0.0065
Barium Sulfate	18	0.000222
	50	0.000336

These solubilities correspond to the following values:

Temperature °C	Barium Carbonate Solubility, mg/L	Soluble Barium, mg/L
18	22	15.3
100	65	45.2

Temperature °C	Barium Sulfate Solubility, mg/L	Soluble Barium, mg/L
18	2.22	1.306
50	3.36	1.977

In the summer, water may be warmer than 18°C, so the theoretical limit would be something higher than 1.306 mg/L barium. By interpolation, at 25°C (77°F) the soluble barium from barium sulfate would be expected to be about 1.45 mg/L.

In addition to the theoretical limit due to solubility, there is a practical limit in solid/liquid separation efficiency. Separation efficiency would have to be 100% in order to achieve a residual total concentration at the solubility level. Solid/liquid phase separation devices are not 100% efficient on all particle sizes, and therefore a level possibly significantly in excess of the solubility level may be achievable.

We suspect that the data from the Effluent Guidelines Program upon which this proposal is based reflect effluents in which the barium either never reached the solubility limit or was diluted below it.

Comment Number: 6-B-7

Docket Number: LD12-00210

Commenter: American Standard

Issue: Barium

Subissue: Treatment Standard

Response:

Based upon the number of comments concerning the proposed wastewater treatment standard, the Agency tends to agree that the data from the Effluent Guidelines Program upon which the proposed D005 wastewater treatment standard was based may reflect effluents in which the barium was diluted. The structure of the Effluent Guidelines database, however, precludes confirmation of this point. To avoid disrupting CWA and SDWA programs, the Agency has chosen to apply prohibitions for characteristic waste prohibitions at the point of disposal.

Comment Number: 6-B-8

Docket Number: L012-00210

Commenter: American Standard

Issue: Barium

Subissue: Treatment Standard

Comment:

Section III.A.5.c(1) states that, ".... barium is typically precipitated as a sulfate salt (barium sulfate) using sodium sulfate, ferric sulfate, or aluminum sulfate as a precipitating reagent". Based on our experience and vendor discussions we suggest that calcium sulfate and ferrous sulfate are also an effective precipitating reagent.

Section III.A.5.c(1) states that "There exists a reasonable potential for an increase in leachability of the resulting waste water treatment sludge (either the barium hydroxide or barium sulfate) during co-disposal with alkaline wastes or materials."

However, if only the sulfate is designated and the hydroxide eliminated, the resulting sludge will not be soluble in either acid, alkaline or neutral wastes or materials. Therefore, no potential increase in leachability is possible.

We recommend that only the sulfate be specified as the precipitating reagent for all barium containing waste waters.

Comment Number: 6-B-9 (continued)
Docket Number: L012-00210
Commenter: American Standard
Issue: Barium
Subissue: Treatment Standard
Comment:

In generating a nonwastewater form of D005 it is quite possible that the barium is already present in the form of a sulfate or carbonate. In this case, acid or water leaching of the waste followed by precipitation as a sulfate or carbonate would be duplicative and serve no useful purpose. Therefore, we suggest the change in the BDAT Treatment Standard for D005 wastes of nonwastewaters to read "Chemical precipitation as a sulfate or carbonate or alternately, just as a sulfate".

Comment Number: 6-B-8
Docket Number: LD12-00210
Commenter: American Standard
Issue: Barium
Subissue: Treatment Standard
Response:

The Agency has chosen to establish a concentration-based treatment standard rather than a method for D005 nonwastewaters. Consequently, the commenter may use any method of treatment to achieve the 100 mg/l treatment standard, including chemical precipitation as a sulfate.

Comment Number: 6-B-9
Docket Number: L012-00220
Commenter: Green Bay Packaging
Issue: Barium
Subissue: Treatment Standard
Comment:

First, we wish to comment on the proposed BDAT Treatment Standard for D005 (Barium wastes) as Wastewaters. The FR Notice lists on page 48515 that the BDAT Treatment Standard proposed for D005 wastewaters is 1.15 mg/l in a 24 hour composite. This appears to be an unreasonable standard in light of the method of treatment proposed as BDAT

Comment Number: 6-B-9

Docket Number: LD12-00094

Commenter: Green Bay

Issue: Barium

Subissue: Treatment Standard

Response:

The Agency has limited data on lime precipitation followed by sedimentation and filtration to support a wastewater treatment standard of 1.15 mg/l. This level is well below the barium characteristic level of 100 mg/l. EPA is establishing treatment standards for wastewaters at the characteristic level, however, to properly integrate LDR and CWA regulatory systems, and to avoid counter productive impacts on UIC nonhazardous waste disposal.

Comment Number: 6-B-10

Docket Number: L012-00094

Commenter: Tricil

Issue: Barium

Subissue: Treatment Standard

Comment:

TESI believes that the appropriate BDAT limit for barium containing wastes should be set at the characteristic level.

Comment Number: 6-B-10
Docket Number: LD12-00094
Commenter: Tricil
Issue: Barium
Subissue: Treatment Standard
Response:

The Agency has limited data indicating that treatment standards for D005 wastes below the characteristic level are achievable. Setting such levels below the characteristic level would diminish risks to human health and the environment for certain D005 wastes. Because characteristic wastes may take diverse forms, however, which EPA has not fully accounted for, EPA has chosen to regulate D005 wastes at the characteristic level of 100 mg/l as was suggested by this commenter.

Comment Number: 6-B-11

Docket Number: LD12-00113

Commenter: Michigan Disposal

Issue: Barium

Subissue: Treatment Standard

Comment:

D005 Barium Wastes Generators of these should be afforded options which reduce the hazardous properties by effective treatment. Systems which employ stabilization currently play an important role in providing adequate capacity for effective treatment of these wastes. Therefore, Michigan Disposal endorses the Agency's regulation of these wastes such that treated wastes no longer exhibit the hazardous characteristic (100.0 mg/L) instead of specification of treatment methods.

Comment Number: 6-B-11
Docket Number: LD12-00113
Commenter: Michigan Disposal
Issue: Barium
Subissue: Treatment Standard
Response:

The Agency proposed a D005 nonwastewater treatment standard expressed as a required method of treatment. Because characteristic wastes may take diverse forms, however, EPA has chosen to regulate D005 wastes at the characteristic level of 100 mg/l, as suggested by this commenter.

Comment Number: 6-B-12
Docket Number: L012-00130
Commenter: Wayne Disposal Inc.
Issue: Barium
Subissue: Treatment Standard
Comment:

Wayne Disposal Incorproated is in full agreement with and therefore supports the following comments submitted to the Docket Clerk by Michigan Disposal Incorporated on January 5, 1990 concerning:

A. Characteristic Wastes

D005 Barium Wastes Generators of these should be afforded options which reduce the hazardous properties by effective treatment. Systems which employ stabilization currently play an important role in providing adequate capacity for effective treatment of these wastes. Therefore, Michigan Disposal endorses the Agency's regulation of these wastes such that treated wastes no longer exhibit the hazardous characteristic (100.0 mg/L) instead of specification of treatment methods.

Comment Number: 6-B-12
Docket Number: LD12-00130
Commenter: Wayne Disposal Inc.
Issue: Barium
Subissue: Treatment Standard
Response:

The Agency proposed a D005 nonwastewater treatment standard expressed as a required method of treatment. Because characteristic wastes may take diverse forms, however, EPA has chosen to regulate D005 wastes at the characteristic level of 100 mg/l, as suggested by this commenter.

Comment Number: 6-B-13
Docket Number: LD12-00143
Commenter: GM
Issue: Barium
Subissue: Treatment Standard
Comment:

It is GM's position that requiring D005 wastewaters and nonwastewaters to meet the existing characteristic level (100 mg/l) will provide sufficient protection of health and the environment. We again wish to stress that "treatment for treatment's sake" should not be required. We therefore recommend that the Agency adopt the option discussed on page 48435, i.e., that the treatment standard for barium in D005 wastewaters and nonwastewaters be established at the existing characteristic level (100 mg/l).

Comment Number: 6-B-13

Docket Number: LD12-00153

Commenter: GM

Issue: Barium

Subissue: Treatment Standard

Response:

The Agency has limited data indicating that treatment standards for D005 wastes below the characteristic level are achieveable. Setting such levels below the characteristic level would diminish risks to human health and the environment and would not be "treatment for treatment's sake" for certain D005 wastes. Because characteristic wastes may take diverse forms, however, EPA has chosen to regulate D005 wastes at the characteristic level of 100 mg/l.

Comment Number: 6-B-14

Docket Number: 2012-00153.

Commenter: Andrews + Kurth (Hammond Lead)

Issue: Barium

Subissue: Treatment Standard

Comment:

Hammond Lead also generates wastes that exhibit the EP toxicity characteristic for barium ("D005 wastes"). In its proposed land disposal restrictions, EPA proposed a BDAT treatment standard of 1.15 mg/l for wastewater forms of D005 wastes and also proposed as the treatment standard for nonwastewater forms of D005 wastes an acid or water leaching treatment followed by chemical precipitation as sulfate or carbonate followed by stabilization. 54 Fed. Reg. at 48434-48435. Both of these proposed BDATs are based on a very limited data base.

Specifically, the BDAT Background Document for D005 indicated that the wastewater BDAT is based on one sample that exhibited the EP toxicity characteristic for barium. Although the precipitation treatment process generated a residue with 1.78 mg/l for barium, EPA has set the proposed BDAT at 1.15 mg/l. Not only has EPA relied on one sample to set its BDAT, but it has also set the BDAT at a level even lower than this limited data would support.

Notwithstanding the absence of data to support the proposed BDAT, EPA has exceeded its authority to regulate hazardous waste by proposing a BDAT below the characteristic level. Once the D005 waste is treated below the characteristic level for barium, the hazardous waste regulatory requirements no longer apply. Accordingly, the BDAT for wastewater forms of D005 should be set at the characteristic level of 100 mg/l for barium.

Comment Number: 6-B-14

Docket Number: LD12-00153

Commenter: Hammond Lead

Issue: Barium

Subissue: Treatment Standard

Response:

As to the commenter's assertion about the Agency's lack of support for the proposed D005 wastewater treatment standard, the Agency believes that the commenter misunderstood the proposed BDAT Background Document for Barium Wastes D005 and P013. On Page 4-2 of this background document is a discussion of the Performance Data for Wastewaters that is the source of the data point to which the commenter alludes. A more careful reading of this discussion, however, makes it clear that the level of 1.78 mg/l based on chemical precipitation was obtained from the literature and is not the basis of the actual proposed wastewater treatment standard. The agency includes a discussion of the Performance Data in all BDAT background documents for the purpose of determining which technologies represent BDAT, not as data used to calculate treatment standards. The wastewater treatment standard was based on treatment data gathered by EPA's Office of Water for lime precipitation followed by sedimentation and filtration, as is discussed in the proposed background document on page 6-1.

This point of apparent confusion, however, is rendered moot by the promulgated treatment standard for D005 wastewaters. The Agency has data to support a treatment standard at a level below the barium characteristic level of 100 mg/l; however, the diversity in forms of wastes that may be classified as D005 wastewaters precludes establishing a treatment standards less than the characteristic level in this rulemaking. The Agency is therefore setting D005 wastewater treatment standards at the 100 mg/l level.

Comment Number: 6-B-15
Docket Number: LD12-001.65
Commenter: PEI
Issue: Barium
Subissue: Treatment Standard
Comment:

The Porcelain Enamel Institute (PEI) is submitting these comments in response to EPA's request for comments on the November 22, 1989, proposed land disposal restrictions. 54 Fed.. Reg. 48372 (1989).

Some manufacturers and users of porcelain enamel generate waste that exhibit the EP toxic characteristic for barium (~~"D005 wastes"~~). In its proposed land disposal restrictions, EPA proposed a BDAT treatment standard of 1.14 mg/l for wastewater forms of D005 wastes and also proposed as the treatment standard for nonwastewater forms of D005 wastes an acid or water leaching treatment followed by chemical precipitation as sulfate or carbonate followed by stabilization. 54 Fed. Reg. at 48434-48435. Both of these proposed BDATs are based on an extremely limited data base.

Specifically, the BDAT Background Document for D005 indicated that the wastewater BDAT is based on one sample. Although the precipitation treatment process generated a residue with 1.78 mg/l for barium, EPA has set the proposed BDAT at 1.15 mg/l. Not only has EPA relied on one sample to set its BDAT, but it has also set the BDAT at a level even lower. This concentration is most likely to be below an achievable level.

In addition to the absence of data to support the proposed BDAT, EPA has exceeded its authority to regulate hazardous waste by proposing a BDAT below the characteristic level. Once the D005 waste is treated below the characteristic level for barium, the hazardous waste regulatory requirements no longer apply. Accordingly, the BDAT for wastewater forms of D005 should be set at the characteristic level of 100 mg/l for barium.

For nonwastewater forms of D005, EPA has proposed a treatment method as the BDAT. Although the proposed land disposal restrictions fail to identify what if any, treatment level must be met to comply with land disposal restrictions, it is PEI's RCRA

Comment Number: 6-B-15
Docket Number: LD12-00153
Commenter: PEI
Issue: Barium
Subissue: Treatment Standard
Response:

As to the commenter's assertion about the Agency's lack of support for the proposed D005 wastewater treatment standard, the Agency believes that the commenter misunderstood the proposed BDAT Background Document for Barium Wastes D005 and P013. On Page 4-2 of this background document is a discussion of the Performance Data for Wastewaters that is the source of the data point to which the commenter alludes. A more careful reading of this discussion, however, makes it clear that the level of 1.78 mg/l based on chemical precipitation was obtained from the literature and is not the basis of the actual proposed wastewater treatment standard. The agency includes a discussion of the Performance Data in all BDAT background documents for the purpose of determining which technologies represent BDAT, not as data used to calculate treatment standards. The wastewater treatment standard was based on treatment data gathered by EPA's Office of Water for lime precipitation followed by sedimentation and filtration, as is discussed in the proposed background document on page 6-1.

The commenter also seems confused as to the meaning of treatment standards expressed as required methods of treatment. When the Agency specifies a method of treatment, as was proposed for D005 nonwastewaters, the waste must be treated by that method prior to land disposal. The subsequent residue, however, is not required to be tested to see if it meets a concentration-based level.

Comment Number: 6-B-15 (continued)
Docket Number: LD12-00153
Commenter: PEI
Issue: Barium
Subissue: Treatment Standard
Response:

Both points of apparent confusion, however, are rendered moot by the promulgated treatment standards for D005 wastewaters and nonwastewaters. The Agency has data to support treatment standards at levels below the barium characteristic level of 100 mg/l; however, the diversity in forms of wastes that may be classified as D005 precludes establishing a treatment standard less than the characteristic level in this rulemaking. The Agency is therefore setting D005 treatment standards at the 100 mg/l level.

Comment Number: 6-B-16
Docket Number: LD12-00179
Commenter: Dow
Issue: Barium
Subissue: Treatment Standard
Comment:

EPA has solicited comments on the BDAT treatment standards for D005 wastes. Dow supports treatment standards set at the characteristic level of hazard, i.e. 100 ppm for barium.

Dow recommends a ~~BDAT standard for all barium wastes of 100 ppm.~~ A technology standard for D005 non-wastewater is inappropriate

Comment Number: 6-B-16

Docket Number: LD12-00179

Commenter: DOW

Issue: Barium

Subissue: Treatment Standard

Response:

The Agency proposed to establish the treatment standard for D005 wastewaters as a level below the characteristic level, and proposed to establish the treatment standard for D005 nonwastewaters as a required method of treatment. Because characteristic wastes may take diverse forms, however, EPA has chosen to regulate D005 wastes at the characteristic level of 100 mg/l.

Comment Number: 6-B-17
Docket Number: L012-00184
Commenter: Lubrizol
Issue: Barium
Subissue: Treatment standard
Comment:

As indicated previously, Lubrizol believes this concentration-based treatment standard should be based on the characteristic level of 100 mg/l as measured by the Extraction Procedure leachate test or the Toxicity Characteristic Leaching Procedure which would be adequate to protect human health and the environment.

Comment Number: 6-B-17

Docket Number: LD12-00184

Commenter: Lubrizol

Issue: Barium

Subissue: Treatment Standard

Response:

The Agency has limited data indicating that treatment standards for D005 wastes below the characteristic level are achieveable. Because characteristic wastes may take diverse forms, however, EPA has chosen to regulate D005 wastes at the characteristic level of 100 mg/l.

Comment Number: 6-B-18
Docket Number: L012-00213
Commenter: Vision-Ease
Issue: Barium
Subissue: Treatment Standard
Comment:

Our current solidification process also converts hazardous glass solids into a form that does not leach more than 5.0 mg./L. without the recovery of lead that the thermal process may give. (See attachment #2 - 1989 Treated Solids Log and Waste Analysis Plan) This attachment shows the analytical results from EP extractions for lead and barium for each shipment of treated glass solids waste. The average result for lead was 2.69 mg./l. and for barium was 43.96 mg./l. The solidification process that produced these results is described in attachment #3. (Standard Operating Procedures for mixing glass solids.)

3) Our waste glass solids contain barium, but not enough to make it a characteristic waste either before or after treatment.

Our concern is that lowering the allowed extraction levels for barium may make our treated glass solids a hazardous waste.

Comment Number: 6-B-18

Docket Number: LD12-00213

Commenter: Vision-Ease

Issue: Barium

Subissue: Treatment Standard

Response:

The commenter does not appear to have a characteristically hazardous barium waste, and if that is the case, the promulgated D005 treatment standards do not apply to barium in their waste. The commenter's concern about lowering the allowed extraction levels (presumably for the purpose of determining when a waste is defined as a hazardous barium waste) is outside the scope of this rulemaking.

Comment Number: 6-B-19
Docket Number: LD12-00148
Commenter: CPC
Issue: Barium
Subissue: Treatment Standard
Comment:

In EPA's discussion of BDAT standards for barium wastewaters, comments are solicited on the option of limiting the treatment standard for D005 wastewaters to the characteristic level of 100 mg/l. After studying this general issue of treatment below characteristic levels as discussed at page 48,490 of the subject Federal Register, CPC believes that the requirements for treatment of any waste should be limited to the characteristic threshold for that waste. To require treatment of a hazardous waste in addition to that which will render it non-hazardous is clearly a contradiction. Further, in view of the anticipated increase in the drinking water standard for barium, to impose a requirement for treatment below the present threshold would be particularly inappropriate.

In summary, CPC recommends that the BDAT Treatment Standards for D005 Wastewaters be established as follows: Maximum concentration for any 24 hour composite sample: 100 mg/l (or alternatively 50 mg/l) Barium as Ba.

CPC believes that it has unique knowledge and experience in the area of barium waste treatment and that the recommendations made above are more than adequate to protect human health and the environment. If EPA requires any additional information or would like to discuss the matter directly with CPC personnel, please contact either Tim McCown or Jerry Cook at 404-382-2144.

Comment Number: 6-B-19

Docket Number: LD12-00148

Commenter: CPC

Issue: Barium

Subissue: Treatment Standard

Response:

The Agency has limited data to support treatment standards at levels below the barium characteristic level of 100 mg/l; however, the diversity in forms of wastes that may be classified as D005 precludes establishing a wastewater treatment standard less than the characteristic level in this rulemaking. The Agency is setting D005 treatment standards at the 100 mg/l level.

Comment Number: 6-B-20
Docket Number: LD12-00081
Commenter: Envirosafe
Issue: Barium
Subissue: Treatment standard
Comment:

We encourage the Agency to develop a numerical standard for the D005 barium waste.

COMMENT NUMBER: 6-B-20
DOCKET NUMBER: LD12-00081
COMMENTER: Envirosafe
ISSUE: Barium
SUBISSUE: Treatment Standard
COMMENT:

The Agency has chosen to set numerical standards rather than required methods of treatment for D005 wastewaters and nonwastewaters. EPA has chosen to regulate D005 wastes at the characteristic level of 100 mg/l.

Comment Number: 6-B-21
Docket Number: LD12-L0034
Commenter: HWTC
Issue: Barium
Subissue: Treatment Standard
Comment:

We concur with Tricil that EPA should include precipitation of Barium from D005 characteristic waste as the phosphate as a treatment option. We have already submitted comments supporting the allowance for other stabilization agents for barium.

COMMENT NUMBER: 6-B-21

DOCKET NUMBER: LD12-L0034

COMMENTER: HWTC

ISSUE: Barium

SUBISSUE: Treatment Standard

COMMENT:

The Agency has chosen to set numerical standards rather than required methods of treatment for D005 wastewaters and nonwastewaters. EPA has chosen to regulate D005 wastes at the characteristic level of 100 mg/l.

Comment Number: 6-B-22

Docket Number: L012-L0034

Commenter: HWTC

Issue: Barium

Subissue: Treatment Standard

Comment:

We also support setting a numeric treatment standard. The HWTC has submitted data of one of our member companies to the docket that may be used to set a numeric treatment standard.

COMMENT NUMBER: 6-B-22
DOCKET NUMBER: LD12-L0034
COMMENTER: HWTC
ISSUE: Barium
SUBISSUE: Treatment Standard
COMMENT:

The EPA has chosen to set numerical standards rather than required methods of treatment for D005 and P013 wastewaters. Consequently the commenter may use any method, including phosphate precipitation, to achieve the concentration-based standard.

Comment Number: 6-C-1
Docket Number: L012-00159
Commenter: WMI
Issue: Barium
Subissue: Preamble vs. Proposed Rule
Comment:

EPA must resolve an inconsistency between the preamble text describing the treatment standard for D005, barium-containing nonwastewaters, and the text of the proposed rule itself. The preamble states that the treatment method is "acid or water leaching followed by chemical precipitation as sulfate or carbonate followed by stabilization." 54 Fed. Reg. at 48,35 (emphasis added). On the same page, however, the text of the proposed rule states that the treatment method is "acid or water leaching followed by chemical precipitation as sulfate or carbonate or stabilization." Id. (emphasis added). The text of the proposed rule would allow D005 wastes to be treated either by stabilization or by leaching followed by chemical precipitation, while the preamble language would mandate a three-step treatment process.

WMI believes that the standard as expressed in the text of the proposed rule should be the one adopted.

Comment Number: 6-C-1

Docket Number: LD12-00159

Commenter: WMI

Issue: Barium

Subissue: Preamble vs. Proposed Rule

Response:

The Agency acknowledges the commenter's observations about the typographical error in the proposed rule. The treatment standard should have read "acid or water leaching followed by chemical precipitation as sulfate or carbonate or stabilization." The Agency is not promulgating this proposed treatment standard for D005 nonwastewaters, however, but is establishing a concentration-based treatment standard of 100 mg/l.

Comment Number: 6-0-1

Docket Number: L012-00148

Commenter: CPC

Issue: Barium

Subissue: MCLG Standard

Comment:

EPA's proposed BDAT Treatment Standard for D005 Wastewaters would require achieving a maximum barium concentration of 1.15 mg/l as Ba for any 24 hour composite sample of wastewater. CPC believes this level of treatment to be overly restrictive in view of currently accepted studies on the toxicity of barium in drinking water.

In the Federal Register of May 22, 1989, EPA itself has proposed to increase the Maximum Contaminant Level Goal (MCLG) for barium under the Primary Drinking Water Standards from 1 mg/l to 5 mg/l. EPA's proposal is based on the following: (a) A study by Wones et al. (Ref. 2) in which humans were exposed to barium in drinking water up to 10 mg/l without adverse effects; (b) A determination by the National Academy of Sciences (Ref. 3), based on the Threshold Limit Value for soluble barium, that 9.4 mg/l of barium represented a safe level for drinking water; (c) An epidemiological study by Brenniman et al. (Ref. 4) in which large populations in the State of Illinois were exposed for long periods to drinking water containing up to 7.3 mg/l of barium, without adverse effects. After applying a factor of safety of 2 to these concentrations, EPA has proposed an MCLG for barium of 5 mg/l. CPC commented extensively in favor of this increase, and has since obtained copies of the comments made to EPA's proposal. All those commenting on the proposed new MCLG for barium were in favor of the increase.

In view of this, the proposed BDAT level of 1.15 mg/l is clearly not warranted. Even with sulfate treatment, this level would be difficult to achieve.

Nevertheless, if the argument prevails that treatment can be required to some level below the characteristic level, CPC urges EPA to establish a more realistic level than the proposed 1.15 mg/l. As discussed above, a level of 10 mg/l of barium in drinking water has been shown to be safe for long-term human exposure. Based on this and allowing for minimal dilution from waste site to drinking water source, treatment to a level no less than 50 mg/l would represent a reasonable and protective treatment standard.

Comment Number: 6-D-1

Docket Number: LD12-00210

Commenter: American Standard

Issue: Barium

Subissue: MCLG Standard

Response:

The commenter's concerns about the proposed Maximum Contaminant Level Goal for barium in drinking water and the anticipated delay in adopting new MCLs into 40 CFR 261.24 are outside the scope of today's rulemaking.

Comment Number: 6-D-2
Docket Number: LD12-00210A
Commenter: American Standard
Issue: Barium
Subissue: MCLG Standard
Comment:

We wish to offer some comments and observations on the proposed Maximum Contaminant Level Goal (MCLG) for barium. We strongly endorse the proposed MCLG of 5 mg/l, and urge that it be issued as a final MCL as quickly as possible. The recommendation to raise the MCL from 1 mg/l to 5 mg/l is entirely consistent with previous detailed comments submitted by Karch & Associates on behalf of American-Standard as well as the recommendation by the National Academy of Sciences in 1985.

We concur with the concept of relying on a weight-of-the-evidence approach when establishing drinking water standards. In the absence of any human data it may be useful (or even necessary) to establish drinking water MCLGs based upon data derived from animals. However, studies in human populations exposed to barium in drinking water at concentrations of 7.3 mg/liter for more than 10 years have not demonstrated any significant effects on either systolic or diastolic blood pressure (Brenniman et al. 1979, 1981). The results of this study were further strengthened by the more recent study by Wones et al. (1987) which demonstrated that drinking water with barium at up to 10 mg/l did not affect any of the known cardiovascular disease risk factors.

The results of studies in humans are backed up by animal studies showing that 100 mg/l of barium in the drinking water is the lowest level that produced significant hypertensive effects (Perry et al. 1983). There is a margin of safety of 13.7 between the Perry et al. level of 100 mg/l and the Brenniman et al. (1981) no effect level of 7.3 mg/l. The margin of safety is increased to 20 when 100 mg/liter is compared to the proposed MCLG of 5 mg/l.

Comment Number: 6-D-2 (cont.)
Docket Number: LD12-00210A
Commenter: American Standard
Issue: Barium
Subissue: MCLG Standard
Comment:

However, we are concerned that even in the event that th MCLG for barium is adopted as the MCL as proposed, ther will be considerable delay before the Office of Solid Wast incorporates this change into a revision of the maximu concentration for barium (D005) as listed in Table 1 in 4 CFR part 261.24. This Table, which is based on the drinking water standards for these substances, should ideally be revised whenever there is a change in any standard. An MCL of 5 mg/l for barium would change the value in this table from 100 mg/l to 500 mg/l. Since it may not be practical to revise the table, we suggest that changes in a particular drinking water standard be incorporated *de facto* by an appropriate administrative order and published in the *Federal Register*.

Comment Number: 6-D-2

Docket Number: LD12-00210

Commenter: American Standard

Issue: Barium

Subissue: MCLG Standard

Response:

The commenter's concerns about the proposed Recommended Maximum Contaminant Level for barium in drinking water are largely outside the scope of today's rulemaking.

Comment Number: 6-0-3
Docket Number: LD12-002408
Commenter: American Standard
Issue: barium
Subissue: MCLG Standard
Comment:

In the Federal Register referenced above, the EPA invites comments on the proposed Recommended Maximum Contaminant Level (RMCL) for barium in drinking water. American Standard Inc. requested Karch & Associates, Inc. to prepare and submit the enclosed comments. For your convenience, also enclosed is a copy of our relevant previous comments on this subject titled - A Review of the Intestinal Absorption and Cardiovascular Toxicity of Barium.

In the Federal Register notice, there were three specific questions for which comments were solicited. These three questions are addressed by the enclosed comments prepared by Karch & Associates, Inc.

We believe that the current barium drinking water standard of 1 mg/l or the proposed provisional AADI of 1.8 mg/l are not defensible based upon available data. The NAS recommendation of 4.7 mg/l is clearly supported by both animal and human epidemiological data. The sole objection to the NAS recommendation (e.g., the differential absorption of barium by infants and adults) is now known to be wrong.

It is of no small concern to us that the substance of the Federal Register questions to which we are now replying are similar to previous questions. In 1984, we offered substantial comments on this subject, but we are still unaware of how these comments were viewed by the agency. As we offered previously, we would like to have the opportunity to review our comments with you and if you are interested, we will make available to you our consultants to discuss the scientific basis of our comments in more detail.

Comment Number: 6-D-3

Docket Number: LD12-00210

Commenter: Karch and Associates

Issue: Barium

Subissue: MCLG Standard

Response:

The commenter's concerns about the proposed Recommended Maximum Contaminant Level for barium in drinking water are outside the scope of today's rulemaking.

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Comment Number: 6-D-4
Docket Number: LD12-00210C
Commenter: Karch + Associates
Issue: Barium
Subissue: MCLG Standard
Comment:

In replying to the three specific questions raised in the Federal Register notice, Karch & Associates, Inc., offers the following comments on behalf of American Standard Inc., for EPA's consideration.

1. Is it appropriate to base the RMCL on the hypertensinogenic and cardiotoxic potential of barium in animals?

Based upon relevant data, it is our opinion that it is inappropriate to base the RMCL on the hypertensive or cardiotoxic potential of barium in animals. We believe it is inappropriate for two reasons: 1) the original MCL for barium was based primarily upon inappropriate routes of administration of barium to animals and 2) there are adequate human epidemiological studies which demonstrate that chronic exposure to 7.3 mg/liter of barium in drinking water is not associated with any adverse cardiovascular effects.

Toxicological studies in experimental animals are traditionally used when there are no data available on exposed humans or when the data on exposed humans are conflicting. When there are sufficient clinical and epidemiological data on exposed human populations, these data are more appropriate to use for establishing relevant exposure standards. With respect to the potential adverse cardiovascular effects of barium, much of the animal data are derived from the results of intravenous administration or *in vitro* studies. Intraveneous administration is an unnatural route of exposure for barium and it is inappropriate to use data derived in this manner to establish standards for oral ingestion of barium.

In the absence of *any* human data it may be useful (or even necessary) to establish drinking water RMCLs based upon data derived from animals. However, human populations exposed to barium in drinking water at concentrations of 7.3 mg/liter for more than 10 years have not demonstrated any significant effects on either systolic or diastolic blood pressure (Brenniman et al. 1981).

Comment Number: 6-D-4 (Cont.)
Docket Number: LD12-00210C
Commenter: Karch + Associates
Issue: Barium
Subissue: MCLG Standards
Comment:

2. Should the epidemiological study by Brenniman et al. (1981) be used for derivations of the RMCL without additional safety factors?

In our opinion, the NAS (1982) recommendation of 4.7 mg/liter is the most appropriate value for the RMCL since it actually provides an additional safety factor over the Brenniman et al. (1981) study. However, the Brenniman et al. (1981) study is clearly an adequate basis for an RMCL. This study demonstrated that chronic consumption of 7.3 mg/liter of barium in drinking water was without any cardiovascular effects and it also serves to verify the more conservative (i.e., risk aversive) NAS (1982) recommendation of 4.7 mg/liter.

If the Brenniman et al. (1981) study were the only available on the possible relationship between barium exposure and potential adverse cardiovascular effects it may not be sufficient for the derivation of the RMCL. However, this is not the case since the Brenniman et al. (1981) study was a further investigation of a Brenniman et al. (1979) study in which the relationship between cardiovascular death rates and barium in drinking water was first investigated. Since the authors themselves raised questions about the ability of this (1979) study to detect differences, they proceeded with the more rigorous study which resulted in the 1981 publication. Even after controlling for time of residence, high blood pressure medication, home water softeners which remove barium, smoking, obesity and occupation there was no significant difference in the systolic and diastolic blood pressures between populations consuming drinking water with mean barium concentrations of 7.3 mg/liter and 0.1 mg/liter, respectively.

With respect to the Brenniman et al. (1981) study, the Federal Register notice (50:46964) suggests that "several factors in this study have been questioned, such as confounding variables, uncontrolled parameters and data inconsistencies." The identity of those raising these objections is not revealed; if these are concerns of the Office of Drinking Water this should have been made more explicit. It is more likely that these criticisms were those of Brenniman et al. in their 1979 study of the relationship between cardiovascular disease death rates and barium in drinking water. The terms "confounding factor" and "uncontrollable factors" only appear in the 1979 publication and not in the 1981 publication. In fact, Brenniman et al. (1981), sensitive to their own comments from 1979, paid special attention to potentially confounding factors in their 1981 study.

Comment Number: 6-D-4 (cont.)
Docket Number: LD12-00210C
Commenter: Karch + Associates
Issue: Barium
Subissue: MCLG Standard
Comment:

The Brenniman et al. (1981) study demonstrating no adverse cardiovascular effects from chronic ingestion of 7.3 mg/liter of barium in drinking water is also indirectly supported by animal data. The study by Perry et al. (1983) showed that 100 mg/liter of barium in the drinking water is the lowest level that produced significant hypertensive effects. The hypertensive effects of 10 ppm barium were of questionable significance and, as noted in the *Federal Register* notice (50:46964) the study may have been flawed by a lack of calcium in the diet which could have contributed to the hypertensive effects observed. There is a margin of safety of 13.7 between the Perry et al. level of 100 mg/liter and the Brenniman et al. (1981) no effect level of 7.3 mg/liter. The margin of safety is increased to over 21 when 100 mg/liter is compared with 4.7 mg/liter which is the Suggested No Adverse Response Level (SNARL) in the NAS (1982) report. The Brenniman et al. (1981) study clearly fulfills the criteria for using a safety factor (uncertainty factor) of 10 (NAS 1982).

3. Should the chronic SNARL value for barium of 4.7 mg/liter be used as the RMCL?

We believe that 4.7 mg/liter is the most prudent value for the barium RMCL. The totality of all available relevant data in conjunction with a conservative (i.e., risk aversive) assumption of 20% intestinal absorption of barium in both children and adults supports the use of the chronic SNARL of 4.7 mg/liter for barium.

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Comment Number: 6-0-4 (cnd.)
Docket Number: LD12-00210C
Commenter: Karch + Associates
Issue: Barium
Subissue: MCLG Standard
Comment:

In 1982, at the request of EPA the National Academy of Sciences reviewed the recent literature and the scientific basis for the barium drinking water standard which was (and still is) 1 mg/liter. Following a careful review of the literature, the NAS Safe Drinking Water Committee concluded that a critical assumption underlying the drinking water standard for barium was incorrect. The assumption that 90% of ingested barium was absorbed from the gastrointestinal tract of infant or adult humans was not supported by any experimental data. The NAS correctly interpreted the literature to yield a correct and conservative value of 20% for the intestinal absorption of barium. This value (in addition to an additional safety factor of 2 and assuming the consumption of 2 liters of water daily) when applied to the original acceptable daily (ADI) intake for barium (3.75 mg derived from the 0.5 mg/m3 TLV) resulted in the recommendation that the drinking water standard be changed from 1 mg/liter to 4.7 mg/liter. The revised calculation was:

$$\frac{3.75\ \text{mg}}{0.2} = 18.75\ \text{mg}: \qquad \frac{18.75\ \text{mg}}{2\ \text{liters}} = 9.375\ \text{mg/liter};$$

$$\frac{9.375\ \text{mg/liter}}{2} = 4.7\ \text{mg/liter}$$

The current barium drinking water standard of 1 mg/liter relied upon a publication by Stokinger and Woodward (1958). With respect to the Stokinger and Woodward (1958) publication which "established" the current barium drinking water standard, the NAS (1982) report noted that there was no "rationale or documentation for using the 90% figure..." Upon discovering that 20% was a more realistic (i.e., scientifically supportable) value for the intestinal absorption of barium, the NAS adopted this value in their recalculations of the barium drinking water standard.

Despite the recommendation by NAS, on October 5, 1983, the EPA published an advance notice of proposed rulemaking (ANPR)

Comment Number: 6-0-4 (cont.)
Docket Number: LD12-00210C
Commenter: Karch + Associates
Issue: Barium
Subissue: MCLG Standard
Comment:

for national revised primary drinking water regulations (Federal Register 48:45502). EPA referred to the NAS (1982) review and suggested that, while 4.7 mg/liter may provide an adequate margin of safety based upon adult intake and exposure (2 liters/day), the NAS report "... did not consider the higher uptake efficiency and water consumption rate of children." The concerns of the EPA were based upon a study by Taylor et al. (1962) which demonstrated that infant rats absorbed considerably more barium than adult rats. EPA requested public comment on gastro-intestinal absorption rates and on cardiovascular effects of barium.

In response to this request, we submitted comments on behalf of American Standard Inc. This report (A Review of the Intestinal Absorption and Cardiovascular Toxicity of Barium) is again submitted as an enclosure to these comments. In general, these 1984 comments demonstrated that significant differences exist between newborn rats and infant humans in the mechanism by which a variety of compounds are absorbed from the intestine. Consequently, newborn rats are not an appropriate experimental model for intestinal absorption of many substances, including barium, in infant humans. Therefore, the concerns expressed by the EPA with respect to children are not justified by the available scientific data.

Comment Number: 6-D-4

Docket Number: LD12-00210

Commenter: Karch and Associates

Issue: Barium

Subissue: MCLG Standard

Response:

The commenter's concerns about the proposed Recommended Maximum Contaminant Level for barium in drinking water are outside the scope of today's rulemaking.

Comment Number: 6-E-1

Docket Number: LD12-00184

Commenter: Lubrizol

Issue: Barium

Subissue: Treatability Group for Barium Wastes Containing Organics

Comment:

In the preamble to the proposed rule, EPA solicited comments whether D005 wastes containing organics exist. Lubrizol does generate barium wastes containing organics which may exhibit the toxicity characteristic for barium. The barium wastes containing organics are mixed wastes which vary in chemical and physical composition. Because of these variations, such wastes may not be adequately treated by the specifically mandated treatment technologies suggested for organic-containing barium wastes at 54 Fed. Reg. 48435 or those actually proposed for all D005 nonwastewaters. Accordingly, Lubrizol recommends the Agency create a separate treatability group for these wastes with a concentration-based treatment standard which would allow Lubrizol and similarly situated firms the flexibility to choose the most appropriate treatment technology.

Comment Number: 6-E-1
Docket Number: LD12-00184
Commenter: Lubrizol
Issue: Barium
Subissue: Treatability Group for Barium Wastes Containing Organics
Response:

The Agency has established concentration-based treatment standards for D005 wastes. Such wastes may be treated by any method, including incineration followed by stabilization, so long as the applicable (i.e., wastewater or nonwastewater) concentration-based treatment standard is achieved in the treatment residue. No additional data were supplied for establishing treatment standards for organobarium wastes, therefore, no separate treatability group is being designated because the Agency has no reason to believe that these wastes are more difficult to treat than other D005 wastes. The Agency is confident, however, based on data submitted on treatment of other D005 wastes, that organobarium wastes can be treated to meet the promulgated treatment standard of 100 mg/l.

Comment Number: 6-E-2
Docket Number: L012-00209
Commenter: ETHYL CORP
Issue: Barium
Subissue: Treatability Group for Barium Wastes Containing Organics
Comment:

D005 wastes containing high levels of organics do exist! Ethyl generates a solid D005 waste containing approximately 50% organic product and 25% barium. This solid stream has typical EP toxicity values of 100-200 mg/l barium and exhibits no other hazardous characteristics. The solids are currently landfilled at a RCRA permitted facility without prior treatment. Ethyl agrees a separate treatability group should be established for these wastes, as the proposed D005 nonwastewater treatment standard is inappropriate for this waste. Ethyl Corporation does not have in house incineration capacity. Is commercial disposal capacity available for the specified treatment standard "Incineration Followed By Stabilization"?

Comment Number: 6-E-2
Docket Number: LD12-00209
Commenter: Ethyl Corp.
Issue: Barium
Subissue: Treatability Group for Barium Wastes Containing Organics
Response:

The Agency has established concentration-based treatment standards for D005 wastes. Such wastes may be treated by any method, including incineration followed by stabilization, so long as the applicable (i.e., wastewater or nonwastewater) concentration-based treatment standard is achieved in the treatment residue. No additional data were supplied for establishing treatment standards for organobarium wastes, therefore, no separate treatability group is being designated because the Agency has no reason to believe that these wastes are more difficult to treat than other D005 wastes. The Agency is confident, however, based on data submitted on treatment of other D005 wastes, that organobarium wastes can be treated to meet the promulgated treatment standard of 100 mg/l.

Comment Number: 6-F-1

Docket Number: LD12-00220

Commenter: Green Bay Packaging

Issue: Barium

Subissue: Drinking Water Levels of Barium

Comment:

On page 48435, the Agency proposes that BDAT for ~~barium~~ nonwastewaters is "acid or water leaching followed by chemical precipitation as sulfate or carbonate or stabilization as methods of treatment". Needless to say these methods will require the use of additional water, at least in some of the steps.

This brings up the issue of introducing additional barium from potable water supplies at levels at or above the proposed BDAT Treatment Standard. Attached for the Agency's review are selected portions of a report entitled DRINKING WATER HEALTH CRITERIA DOCUMENT ON BARIUM, U.S. Environmental Protection Agency, Washington, DC. Included are the cover page, the inside title page, the report documentation page and two pages of text.

As can be seen in the third full paragraph on page II-10, there is reported data showing that drinking water sources can contain between 1.1 mg/l and 10 mg/l of barium. Obviously such sources of background contamination will render the proposed BDAT Treatment Standard as an unreasonable standard. It would seem to make little sense to have to clean up the treatment water by removing Barium in order to treat Barium-containing waste. A treater would be generating additional hazardous waste just to make clean enough water for treating Barium-containing waste.

We suspect that there could be many other similar situations involving naturally-occurring background levels of RCRA regulated metals in the nation's water supply. The USEPA Office of Solid Waste would do well to consider the other sources of information available to it within USEPA that might shed light on this potential for setting impractical or unattainable treatment standards. We therefore urge USEPA to reconsider the proposed BDAT Treatment Standard and to set it at a level which will not be affected by the naturally occurring background levels of the nation's potable water supplies.

Comment Number: 6-F-1

Docket Number: LD12-00220

Commenter: Green Bay Packaging

Issue: Barium

Subissue: Drinking Water Levels of Barium

Response:

The Agency has data to support treatment standards at levels below the barium characteristic level of 100 mg/l; however, the diversity in forms of wastes that may be classified as D005 precludes establishing a wastewater treatment standard less than the characteristic level in this rulemaking. The Agency is setting D005 treatment standards at the 100 mg/l level.

The Agency agrees with the commenter's suggestion that information is available within other EPA offices that would be useful for setting treatment standards. The Office of Solid Waste uses data generated by other offices within EPA whenever it is appropriate; however, it should be remembered that data generated for different purposes will be based on different criteria. The treatment standards developed for the land disposal restrictions are based on the technical performance of BDAT for specific waste streams. When data generated by other offices within EPA correspond to this criteria, as is the case for much of the data used to set wastewater treatment standards in today's final rule (generated by EPA's Office of Water; see the BDAT Background Document for BDAT-List Wastewaters, 1989) it is used to establish or support treatment standards for the land disposal restrictions.

ISSUE CODE 7:D006 - Characteristic Wastes for Cadmium

A.-. Problems in Management of Household Battery Wastes
B.-. Cadmium Wastes not Similar to F006 or K061
C.-. Set Standards at EP Level
D.-. Set Treatment Method Instead of Level
H.-. Foundry Wastes Cannot Meet Standards
I.-. Inconsistencies in Setting Standards
K.-. Allowance of Alternate Technologies
L.-. Stepwise Recovery of MOre than One Constituent may Require Processing at More than One Site
M.-. Most Batteries are not Hazardous Wastes
N.-. Data Submittal

Comment Number: 7-A-1

Docket Number: LD12-00218

Commenter: NEMA National Electrical Manufacturers Assoc.

Issue: Cadmium

Subissue: Problems in management of household battery wastes

Comment:

Therefore, the proposed thermal recovery process as a method of treatment for spent industrial-type Ni-Cd wet cell batteries is actually being practiced in the U.S. and so NEMA agrees with the proposed treatment technology for this type of Ni-Cd battery as opposed to landfilling.

COMMENT NUMBER: 7-A-1
DOCKET NUMBER: LD12-00218
COMMENTER: NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
ISSUE: Cadmium
SUBISSUE: Thermal Recovery of Cadmium
RESPONSE:

The Agency thanks the National Electrical Manufacturers Association for their support of this segment of the proposed regulation. The Agency is promulgating as proposed.

Comment Number: 7-A-2
Docket Number: L012-00088
Commenter: Inco (INMETCO)
Issue: Cadmium
Subissue: Problems in Management of Household Battery Wastes
Comment:

IV. EPA Should Make Clear that When Thermal Recovery Is Specified as a Method of Treatment, It Need Not Occur at a Single Facility.

For a number of wastes covered by the earlier Land Disposal Restriction Rules (e.g., high zinc K061) or by the present proposal (e.g., cadmium batteries, a nonwastewater form of D006), EPA has specified Thermal Recovery (or Resmelting in a High Temperature Metals Recovery Furnace) as the method of treatment.[15] As indicated in Part II above, we agree with EPA that thermal recovery technologies should be specified as the method of treatment under Section 3004(m)(1) of RCRA for hazardous wastes that contain recoverable metal values. Accordingly, we support the designation of Thermal Recovery as a Method of Treatment for cadmium batteries. In fact, we believe EPA should reconsider its proposal to grant a national capacity variance for cadmium batteries since, contrary to the Agency's belief,[16] there is capacity for thermal recovery of nickel-cadmium batteries, at INMETCO.[17]

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[15] See 54 Fed. Reg. at 48436, 48457.

[16] See 54 Fed. Reg. at 48480/3.

[17] INMETCO currently processes approximately 70 tons/year of nickel-cadmium batteries to recover nickel and sends the cadmium-containing residues to an outside facility for recovery of cadmium. We expect this volume to increase in the future.

Comment Number: 7-A-2 (continued)
Docket Number: LD12-00088
Commenter: Inco (INMETCO)
Issue: Cadmium
Subissue: Problems in Management of Household Battery Wastes
Comment:

To avoid possible confusion, however, EPA should make clear that when it specifies thermal recovery as a method of treatment, the thermal recovery need not occur in a single process or at a single facility. A hazardous waste may contain several recoverable metals, some of which are recovered in one thermal process, while others are recovered in a second thermal process. Nickel-cadmium batteries are a good example. While INMETCO reclaims the nickel values, its process cannot recover the cadmium directly. Instead, the cadmium-containing residues of INMETCO's process are manifested as hazardous waste and sent to a separate thermal recovery facility, where cadmium, as well as zinc and lead values, are recovered.18/ EPA should recognize the existence of such sequential metals recovery processes when it promulgates the final rule in this proceeding.

COMMENT NUMBER: 7-A-2
DOCKET NUMBER: LD12-00088
COMMENTER: INCO
ISSUE: Cadmium
SUBISSUE: Problems in management of battery wastes
RESPONSE:

Recovery of cadmium from spent batteries may occur either in pryometallurgical operations or by mechanical processes where the cadmium component is recovered from the battery and sent elsewhere for thermal recovery. In addition, all recovery need not occur in a single facility or in a particular sequence.

The proposed regulations for D006 wastes are based on thermal recovery as a method of treatment for the cadmium content of the wastes. They do not specify, however, that metals recovery operations all be conducted at a common site. The Agency realizes that some wastes, such as nickel cadmium batteries, spent catalysts, etc. may contain more than one recoverable constituent and that individual waste treatment operations may not be able to fully recover all valuable constituents at a single processing site. Processing at more than one facility may be needed to recover all materials of value.

Residues from the operations are no longer in the cadmium containing battery subcategory. If they continue to exhibit the characteristic for cadmium however, they would still be prohibited wastes in the D006 treatability group and would have to be treated to meet the standards for D006 wastes.

The Agency also thanks Inco for providing information on current available capacity for recovery of cadmium from batteries.

Comment Number: 7-B-1
Docket Number: LD12-00049
Commenter: RMT, Inc.
Issue: Cadmium
Subissue: Cadmium wastes not similar to F006 or K061
Comment:

The BDAT treatment criteria were based on K061 wastes for cadmium and F006 wastes for lead. These wastes, particularly the F006 waste, are considerably different from foundry cupola emission control wastes or other D008 wastes. Specifically, foundry cupola emission control wastes can have several characteristics or constituents that hinder stabilization using a cement-based solidification as was done for F006. These include the very fine particle size and the high iron, zinc, and other metals contents. Since the treatment technology proposed for D008 wastes is based on treatment of wastes which did not encompass these problems, it is unrealistic to assume that treatment of all D008 wastes will be able to meet these criteria.

COMMENT NUMBER: 7-B-1
DOCKET NUMBER: LD12-00049
COMMENTER: RMT INC.
ISSUE: Cadmium
SUBISSUE: Cadmium wastes not similar to F006 or K061
RESPONSE:

In many respects the wastes from foundries resemble F006 and K061. Both wastes tend to be highly variable in content and, hence, are difficult to treat. Both may contain iron, lead, and zinc. Data supplied by the commenter in Table 3 of his attachment show that samples can be treated by stabilization with magnesium oxide or calcium phosphate to meet the standards. Many electroplating facilities generating F006 using stabilization have also found similar problems in some instances but modifications to stabilization formulations have helped to overcome these problems. For example, some plants have used Chemfix or other proprietary formulations which have high silicate contents.

The Agency notes that two commercial waste treatment firms have expressed similar concerns about being able to consistently treat all D006 wastes to significantly below characteristic levels. Wastes managed by these firms include foundry and non-foundry generated residues.

Based on the data received during the comment period, EPA is revising the proposed treatment standards. EPA is promulgating treatment standards at the characteristic level of 1.0 mg/l cadmium for D006 wastewaters and 1.0 mg/l as measured in the TCLP leachate for nonwastewaters. If RMT feels these wastes still present problems after trying such modifications, they should apply for a variance.

Comment Number: 7-B-2
Docket Number: LD12 00051
Commenter: American Cast Metals Association
Issue: Cadmium
Subissue: Cadmium wastes not similar to F006 or K061
Comment:

While the ACMA understands the need for the EPA to take a generic approach in grouping similar wastes or processes in a rulemaking of this magnitude, this is not a valid starting point for all industries or all wastes. While there are some similarities between foundry waste and wastes of electroplaters and explosive manufacturers with whom foundries are grouped, there is no similarity in the effectiveness of treatment technologies between the group members.

COMMENT NUMBER: 7-B-2

DOCKET NUMBER: LD12-00051

COMMENTER: AMERICAN CAST METALS ASSOCIATION

ISSUE: Cadmium

SUBISSUE: Cadmium wastes not similar to F006 or K061

RESPONSE:

Several facilities from the foundry industry have submitted comments claiming they cannot treat the D006 wastes to the 0.14 mg/l cadmium as measured by TCLP for nonwastewaters or 0.2 mg/l cadmium for wastewater. However, some commenters submitted data showing that available stabilization methods can treat their wastes to levels below or at the wastewater level of 1.0 mg/l for cadmium. As a result, EPA is revising the proposed treatment standards. EPA is, instead, promulgating treatment standards at the characteristic level of 1.0 mg/l cadmium for D006. Compliance with this new standard must be measured by the TCLP extract for D006 nonwastewaters.

Comment Number: 7-B-3
Docket Number: LD12-00089
Commenter: Mill Service, Inc.
Issue: Cadmium
Subissue: Cadmium wastes not similar to F006 or K061
Comment:

In establishing certain metal waste treatment standards, we believe that EPA has not been consistent in its reasoning as to the basis for the proposed levels. For example, one of the proposed non-wastewater standards for cadmium wastes is 0.14 mg/l based on the transfer of K061 data. EPA believes that K061 represents a particularly difficult waste to stabilize and therefore a reasonable basis by which to set the cadmium waste treatment standard. However, the proposed wastewater standard for cadmium wastes, 0.20 mg/l, has been based on the transfer of data from the Effluent Guidelines Program due to a lack of data on the treatment of cadmium in RCRA D006 wastewaters. Yet K061, F006 and K069 wastewaters have cadmium treatment standards of 1.6 mg/l. Using the same reasoning as in the non-wastewater cadmium standard, a 1.6 mg/l standard would appear to be more appropriate and representative of difficult to treat wastes containing cadmium. Similar discrepancies exist in the treatment standards fo chromium non-wastewaters (0.094 mg/l for D007; 5.2 mg/l for K006 an F019) and lead wastewaters (0.040 mg/l for D008; 3.4 mg/l for K002 and potentially others. EPA should maintain a consistent approach i establishing the metal waste treatment standards based on the most difficult waste treatability data available.

COMMENT NUMBER: 7-B-3

DOCKET NUMBER: LD12-00089

COMMENTER: MILL SERVICE INC.

ISSUE: Cadmium

SUBISSUE: Cadmium wastes not similar to F006 or K061

RESPONSE:

The Agency recognizes the difficulties associated with treating metals in the various F, K, and D wastes. The Agency has evaluated data that are applicable to each waste code and has set treatment standard based on the performance data available for the best demonstrated technology for each waste code. EPA has maintained a consistent approach on calculating treatment standards for each waste code. This methodology has been published with the First and Second Thirds Final Rules.

Based on additional data received from commenters for D006 wastes which show treatment of cadmium below or at the characteristic level, the Agency has decided to revise its proposed standards of 0.14 mg/l for D006 nonwastewaters. The Agency is, instead, promulgating a treatment standard set at the characteristic level of 1.0 mg/l in the TCLP extract for nonwastewater and 1.0 mg/l in wastewater forms of D006.

Comment Number: 7-13-4
Docket Number: LD12-00094
Commenter: TRICIL
Issue: Cadmium
Subissue: Cadmium wastes not similar to F006 or K061
Comment:

It is unrealistic for U.S. EPA to select a listed waste such as K061 or F006, evaluate the treatment levels achieved for a particular metal and then assume that these levels are achievable for a category of wastes as broad as the characteristic wastes.

COMMENT NUMBER: 7-B-4
DOCKET NUMBER: LD12-00094
COMMENTER: TRICIL
ISSUE: Cadmium
SUBISSUE: Cadmium wastes not similar to F006 or K061
RESPONSE:

The commenter has not submitted any data showing specifically which wastes prove to be problematic with respect to the proposed treatment standards. However, the commenter's concerns are moot under the revised treatment standards which have been set at the characteristic level of 1.0 mg/l for D006 nonwastewaters and measured in the TCLP extract and 1.0 mg/l in D006 wastewaters. The Agency is impressed, however, that a commercial waste treatment facility is making the point regarding the broad range of D006 wastes to be treated and the inability to transfer treatment data that would show general achievability.

Comment Number: 7-B-5
Docket Number: LD12 - 00097
Commenter: Aluminum Recycling Association
Issue: Cadmium
Subissue: Cadmium wastes not similar to F006 or K061
Comment:

Non-Applicability of Data Transfer Methodology

- In determining new standards for lead, cadmium, and chromium, the EPA applied data it had previously obtained from other industries, and in particular electroplating and steelmaking;

- This procedure is inapplicable to the secondary aluminum industry since its manufacturing processes and generated wastes are significantly different--physically and chemically--from that used to set treatment standards;

- Non-waste water is a very broad term encompassing very wet sludges, as well as slightly wet solids and should not include or be transferable to dry furnace and incineration-related baghouse dust;

- It is easier to remove impurities from electroplating waste waters since effective techniques inducing precipitation of lead, cadmium, and chromium in solution are available; however, water solution technology is not transferable to dry solids or to the secondary aluminum smelter's waste which, as furnace and incineration-related baghouse dust, is a dry solid particulate;

- Stabilization techniques, as the EPA itself indicates, are not effective for metals in complex matrices. The secondary aluminum industry's furnace and incineration-related baghouse dust is a complex matrix mixture of metal chloride salts and, therefore, not easily separated out of solution by current technologies;

- Incineration or other heat-treating technologies currently in use in steelmaking are not applicable in the treating of secondary aluminum furnace and incineration-related baghouse dust because the dust waste originally emanates from a high temperature smelting process and, therefore, is not readily susceptible to further heat treatment.

COMMENT NUMBER: 7-B-5
DOCKET NUMBER: LD12-00097
COMMENTER: ALUMINUM RECYCLING ASSOCIATION
ISSUE: Cadmium
SUBISSUE: Cadmium wastes not similar to F006 or K061
RESPONSE:

The commenter has raised several issues regarding the nonsimilarity of their wastes to F006 or K061. The commenters waste is a baghouse dust containing chlorides. As such, it probably requires preliminary washing and chemical treatment prior to stabilization. Washing will remove soluble chlorides. Chemical treatment of the washed wastes and the washwater will convert soluble cadmium compounds to insoluble cadmium sulfide or hydroxide. Thus, additional treatments prior to stabilization may be needed. The Agency notes that washing is part of the treatment procedure for K071 wastes and that chemical precipitation is normally practiced for D006 wastewaters. Thus, these pretreatments may be viewed as Demonstrated.

In developing the proposed regulations, the Agency used data available at the time. Additional data on stabilization of foundry and non-foundry related D006 wastes was provided by other commenters and after review of that information, the agency has promulgated treatment standards at the characteristic levels of 1.0 mg/l for cadmium nonwastewaters as measured by TCLP, and of 1.0 mg/l cadmium for wastewaters as measured by total constituent analysis. Since EPA is promulgating a concentration-based standard, EPA is not requiring specific technology to be used to treat the D006 wastes.

If the commenter feels the wastes of his industry cannot meet the proposed treatment standards, data should be submitted to the Agency to verify this point. Treatment standards for processes which do not recover hazardous constituents must be specific in order to insure that wastes are being properly managed.

Comment Number: 7-B-6
Docket Number: LD12-00104
Commenter: The Wheland Foundry
Issue: Cadmium
Subissue: Cadmium wastes not similar to F006 or K061
Comment:

The BDAT treatment criteria were based on K061 wastes for cadmium and F006 wastes for [redacted] These wastes, particularly the F006 waste, are considerably different from foundry cupola emission control baghouse dusts. Foundry cupola baghouse wastes can have several characteristics or constituents which hinder stabilization using a cement-based solidification as was done for F006. These include the very fine particle size and the high iron, zinc, and other metals contents. Because the treatment technology proposed for D008 wastes is based on treatment of wastes which did not encompass these problems, it is unrealistic to assume that treatment of all D008 wastes will be able to meet these criteria.

COMMENT NUMBER: 7-B-6
DOCKET NUMBER: LD12-00104
COMMENTER: THE WHELAND FOUNDRY
ISSUE: Cadmium
SUBISSUE: Cadmium wastes not similar to F006 or K061
RESPONSE:

The Agency appreciates the receipt of data from the Wheland Foundry which consisted of two sets of stabilization data. The data submitted by the commenter was also part of the data submission by RMT Corporation. That overall data base showed that for foundry D006 wastewaters, special stabilization mixtures must sometimes be used to obtain leachate levels below the characteristic level. Indeed, several stabilization mixtures showed TCLP leachate levels for cadmium at or below 0.8 mg/l. Two commercial waste treatment facilities expressed similar concerns about the ability to treat all D006 wastes to significantly below characteristic levels in all cases. The Agency has considered the data from the foundry and other industries and has decided to set the treatment standard for D006 nonwastewaters at the characteristic level of 1.0 mg/l in the TCLP leachate and 1.0 mg/l for D006 wastewaters.

Comment Number: 7-B-7
Docket Number: LD12-00113
Commenter: Michigan Disposal, Inc.
Issue: Cadmium
Subissue: Cadmium not similar to F006 or K061
Comment:

D006 Cadmium Wastes: The proposed treatment levels suggest that the Agency apparently considers these wastes analogous to K061 (electric arc furnace dust) wastes for which standards were established in the First Third. Waste water treatment conditions differ drastically from those encountered in treatment of solid wastes. Therefore standards applicable to one cannot be considered transferable to the other especially where variable waste streams, such as the D006 cadmium wastes, are being treated. Michigan Disposal endorses the Agency's regulation of these wastes such that treated wastes no longer exhibit the hazardous characteristic (1.0 mg/L) instead of specification of treatment methods.

COMMENT NUMBER: 7-B-7

DOCKET NUMBER: LD12-00113

COMMENTER: MICHIGAN DISPOSAL INC.

ISSUE: Cadmium

SUBISSUE: Cadmium wastes not similar to F006 or K061

RESPONSE:

The commenter has not submitted any data showing their waste could not meet the proposed treatment standard of 0.14 mg/l in the TCLP leachate for D006 nonwastewaters. However, based on additional data received from other commenters, the Agency has decided to revise the proposed standard and is promulgating a new treatment standard of 1.0 mg/l in the TCLP extract for D006 nonwastewaters and 1.0 mg/l for D006 wastewaters. Since EPA is promulgating a concentration-based standard, a specific treatment method is not required to be used to achieve the treatment standards. Other applicable technologies can be used as long as the concentration levels in the residuals meet the treatment standards.

Comment Number: 7-B-8
Docket Number: LD12-00130
Commenter: Wayne Disposal, Inc.
Issue: Cadmium
Subissue: Cadmium wastes not similar to F006 or K061
Comment:

D006 Cadmium Wastes: The proposed treatment levels suggest that the Agency apparently considers these wastes analogous to K061 (electric arc furnace dust) wastes for which standards were established in the First Third.. Waste water treatment conditions differ drastically from those encountered in treatment of solid wastes. Therefore standards applicable to one cannot be considered transferable to the other especially where variable waste streams, such as the D006 cadmium wastes, are being treated. Michigan Disposal endorses the Agency's regulation of these wastes such that treated wastes no longer exhibit the hazardous characteristic (1.0 mg/L) instead of specification of treatment methods.

COMMENT NUMBER: 7-B-8

DOCKET NUMBER: LD12-00130

COMMENTER: WAYNE DISPOSAL INC.

ISSUE: Cadmium

SUBISSUE: Cadmium wastes not similar to F006 or K061

RESPONSE:

The commenter has not submitted any data to document difficulties in treating specific D006 nonwastewaters. However, the Agency has reviewed data submitted by other commenters and has decided to revise the proposed treatment standards. The Agency accordingly is promulgating a treatment standard of 1.0 mg/l in the TCLP extract for D006 nonwastewaters and 1.0 mg/l for D006 wastewaters.

Comment Number: 7-B-9
Docket Number: LD12-00222
Commenter: American Foundrymen's Society
Issue: Cadmium
Subissue: Cadmium wastes not similar to F006 or K061
Comment:

1. **The proposed treatment standards for D006 (cadmium) and D008 (lead) are based on wastes which are dissimilar to those generated by foundries and should not be applied to foundry wastes.**

As a result of the above factors, treatment data from F006 (electroplating) and K046 (explosive manufacturing) cannot be applied to wastes generated by foundries which may be subject to the proposed rules. F006 and K046 represent waste which are much more homogeneous than foundry wastes. The lead and cadmium content of EP toxic foundry waste varies more than F006 and K046 waste streams used to develop the treatment criteria.

COMMENT NUMBER: 7-B-9
DOCKET NUMBER: LD12-00222
COMMENTER: AMERICAN FOUNDRYMANS ASSOCIATION
ISSUE: Cadmium
SUBISSUE: Cadmium wastes not similar to F006 or K061
RESPONSE:

Several commenters in the foundry industry have discussed in their comment submission to the problems of treating D006 wastes by stabilization and the need to test specific stabilization mixes with individual batches of waste to ensure optimum results can be achieved. Similar problems have been encountered with both F006 and K061 wastes in other industries. Foundry wastes are expected to resemble K061 because both the electric arc steel and foundry processes use steel scrap as a feed material. In addition, some foundries use electric arc furnaces while others use cupolas. Because cool material descends into the hot areas of the cupolas, emerging gases cool the entering metal with the result that less metal volatilization is expected to occur. Hence, foundry baghouse dusts should contain less lead, cadmium and zinc then some K061 wastes. The Agency has reviewed all submitted data and has decided to change the proposed treatment standard for D006 nonwastewaters. In general, all of the data received show that with several stabilization mixtures, TCLP leachate levels of below 0.8 mg/l cadmium can be achieved. In any case, the Agency is promulgating a treatment standard of 1.0 mg/l cadmium in the TCLP leachate for D006 nonwastewaters and 1.0 mg/l cadmium for D006 wastewaters. The Agency does not believe the modest increment between 0.8 mg/l and 1.0 mg/l warrants imposition of the lower standard at this time.

Comment Number: 7-B-10
Docket Number: LD12-00262
Commenter: Owens Illinois
Issue: Cadmium
Subissue: Cadmium wastes not similar to F006 or K061
Comment:

Secondly, the BDAT and treatment standards for D006, D007 and D008 wastes have been developed from data applicable to only one set of conditions which generates this type of waste, i.e. electric arc furnace dust (K061), pickle liquor sludge (K0672) and electro plating sludge (F006) respectively. The application of BDAT and treatment standards based on specific waste streams, K061, K062 and F006, and then applied to the extremely large universe of varying types of wastes which exhibit D006, D007 and D008 characteristics is inappropriate. The EPA has not shown that the BDAT is applicable or that sufficient nationwide capacity exists for the universe of D006, D007 and D008 wastes to either apply BDAT to treat these wastes or that the treatment levels are achievable. The transfer of treatment standards from other listed wastes to the characteristic wastes in general should be reviewed again and an interim national capacity variance be issued for characteristic wastes until BDAT and performance standards are demonstrated for characteristic wastes.

Thank you for allowing us to comment on the proposed rule.

COMMENT NUMBER: 7-B-10
DOCKET NUMBER: LD12-00262
COMMENTER: OWENS ILLINOIS
ISSUE: Cadmium
SUBISSUE: Cadmium wastes not similar to F006 or K061
RESPONSE:

The Agency agrees that D006 nonwastewaters may include a wide variety of waste materials with significantly different EP toxic metal contents. The Agency notes, however, that the commenter has not provided any data on specific treatment problems for their D006 wastes.

The Agency reaffirms its position that transferring of treatment data for cadmium from K061 and F006 wastes is a valid procedure. However, the Agency has not examined all possible forms of D006 wastes. Both K061 and F006 wastes are likely to contain other EP toxic constituents and both are expected to contain a variety of waste matrices. For example, F006 nonwastewaters may also contain complexing agents and K061 particulates may also contain iron oxides, silica, and other materials used in the steel making process.

The Agency has examined treatment data submitted by commenters. These data show that available treatment technologies can be used to treat D006 wastes to levels below or at the 1.0 mg/l characteristic level for cadmium. EPA has decided to revise the proposed treatment standards and promulgate treatment standards at the characteristic level of 1.0 mg/l in the TCLP leachate for D006 nonwastewaters and 1.0 mg/l for wastewaters.

Comment Number: 7 - B - 11
Docket Number: L012-00042
Commenter: American Foundrymen's Society
Issue: Cadmium wastes not similar to F006 or K061
Subissue:
Comment:

Dissimilarity In Wastes

Technology for electroplating wastewater treatment sludges (F006) and explosives manufacturing (K046) sets the treatment standard for the Low Lead Subcateogry. These waste streams, F006 and K046 are so unlike those generated by foundries and ingot manufacturers that treatment data from F006 and K046 cannot and should not be used to set treatment standards for the foundry and ingot industries. When stabilization technology is utilized, EP and TCLP levels are not consistently near or below the proposed treatment standards for nonwastewater waste containing lead or cadmium (attachments 3, 4 and 5).

COMMENT NUMBER: 7-B-11
DOCKET NUMBER: LD12-00042
COMMENTER: AMERICAN FOUNDRYMAN'S ASSOCIATION
ISSUE: Cadmium
SUBISSUE: Cadmium wastes not similar to F006 or K061
RESPONSE:

The data submitted by the commenter was part of the material submitted by other organizations (RMT, Wheland Foundry). The data show that formulations of stabilizing agents may need to be changed when processing some batches of D006 nonwastewaters. The data show that cadmium levels in EP leachates of approximately 0.8 mg/l can be achievable with at least eight stabilizaton mixtures using super phosphates and/or magnesium oxides as additives. Lead levels in these same leachates were below characteristic levels. The Agency has examined all of this information and has decided to set the treatment standard for D006 nonwastewaters at the characteristic level of 1.0 mg/l in the TCLP leachate. Data from the foundry industry show this level is readily achievable for cadmium in a difficult to treat matrix and other commenters including those from the commercial waste treatment industry have indicated that treatment standards at or near the characteristic level could be achieved.

Comment Number: 7-C-1
Docket Number: LD12-00049
Commenter: RMT, Inc.
Issue: Cadmium
Subissue: Set standards at EP levels
Comment:

BDAT treatment standards which are below the EP Toxicity level are inconsistent. Wastes where lead and cadmium are below the EP-Toxic level, but above the treatment criteria, are allowed to be disposed without treatment. Why should wastes that leach lead at over the EP-Toxic level be required to be treated to a lower level? By the federal definition, if the waste leaches lead or cadmium at below the EP-Toxic level, it is nonhazardous. EP-Toxic wastes are EP-Toxic because they leach metals at over the criteria and are different from listed wastes in this regard. If a waste that leaches less than 5 mg/L lead or 1 mg/L cadmium does not pose a threat to the environment when land disposed, why should a treated waste that leaches lead at the same level pose a threat when disposed in the same manner?

COMMENT NUMBER: 7-C-1
DOCKET NUMBER: LD12-00049
COMMENTER: RMT INC.
ISSUE: Cadmium
SUBISSUE: Set standards at EP level
RESPONSE:

Under HSWA, the Agency is required to set treatment levels or methods of treatment which substantially reduce the likelihood of migration of hazardous constituents from the waste so that short-term and long-term threats to human health and the environment are minimized. However, based on the data submitted to the Agency by commenters, the Agency has decided to revise the treatment standards for D006 wastes. The new treatment standards are set at the characteristic level of 1.0 mg/l as measured in the TCLP leachate for nonwastewaters and 1.0 mg/l for D006 wastewaters.

Comment Number: 7-C-2
Docket Number: L012-0007B
Commenter: Glass Packaging Institute
Issue: Cadmium
Subissue: Set standards at EP level
Comment:

The proposed BDAT limits for D006, D007 and D008 waste are generally about an order or magnitude below the respective EP-toxicity levels for these wastes. The Agency acknowledges that the statute does not compel EPA to promulgate treatment standards below these levels. Preamble at 48,490/1. Nonetheless, EPA has chosen to do so because the EP-toxicity levels are not necessarily health-based, such that further minimization of threats to human health and the environment might be realized by imposing the proposed levels. However, the Agency recognizes that policy and/or feasibility considerations may make setting standards lower than the characteristic levels problematic. Thus, as an interim approach, EPA is considering promulgating levels that do not require treatment below these levels. Preamble at 48,491.

COMMENT NUMBER: 7-C-2

DOCKET NUMBER: LD12-00078

COMMENTER: GLASS PACKAGING INSTITUTE

ISSUE: Cadmium

SUBISSUE: Set standards at EP level

RESPONSE:

Based on the data submitted to the Agency during the comment period, the Agency has decided to revise the treatment standards for D006. The treatment standards to be promulgated in the Third Thirds Rule are set at the characteristic level of 1.0 mg/l as measured in the TCLP leachate for D006 nonwastewaters and 1.0 mg/l for D006 wastewaters.

Comment Number: 7-C-3
Docket Number: LD12-00089
Commenter: Mill Service, Inc.
Issue: Cadmium
Subissue: Set standards at EP level
Comment:

Proposed Concentration Levels - In several instances, EPA has requested comment on whether it should establish metal waste treatment standards at the characteristic levels or at levels below the characteristic levels when the lower levels are achievable using BDAT. Without regard to the intent of the Hazardous and Solid Waste Amendments or the legality of requiring treatment to less than characteristic levels prior to disposal, we believe that establishing metal waste treatment standards at levels below the characteristic levels is unreasonable and imposes significant burdens on characteristic waste generators. It is inconceivable to us that EPA would consider setting standards which will create situations in which treated characteristic wastes will not be permitted to be land disposed because they do not meet the treatment standard while non-hazardous wastes containing the same constituents at higher concentrations will be permitted to be land disposed. We believe that it would be more appropriate for EPA to modify (lower) the characteristic levels for the metal wastes where their treatment technology investigations have determined that lower levels are achievable, thereby creating a uniform standard for the regulated community.

COMMENT NUMBER: 7-C-3
DOCKET NUMBER: LD12-00089
COMMENTER: MILL SERVICE INC.
ISSUE: Cadmium
SUBISSUE: Set standards at EP level
RESPONSE:

The Agency has considered data received from several commenters and has decided to review the proposed treatment standards. EPA will promulgate the treatment standards at the characteristic level for D006 wastes which is 1.0 mg/l as measured in the TCLP leachate for nonwastewaters and 1.0 mg/l for wastewaters. By setting the treatment standards at the characteristic level, the commenter's concerns about treatment standards below the characteristic level have been eliminated.

Comment Number: 7-C-4
Docket Number: LD12-00094
Commenter: TRICIL
Issue: Cadmium
Subissue: Set standards at EP level
Comment:

D006 proposed BDAT limit should be raised.

As previously stated, TESI believes all of the characteristic wastes should have BDAT limits set at the characteristic level. In addition to this philosophical/legal objection to the proposed BDAT cadmium limits, TESI has several technical objections. TESI receives and treats a number of D006 waste streams (non-wastewater) using the previously described treatment process. Untreated cadmium concentrations range from 100 - several hundred ppm total cadmium. Attached to these comments are approximately twelve months of summary data showing E.P. tox. data for treated wastes. As will be noted, TESI usually achieved cadmium levels equal to or less than proposed BDAT cadmium limits. However, in several instances, proposed BDAT limits were not achieved. These instances exist for the very reasons U.S. EPA acknowledges in its proposal (i.e., high concentrations of oil and grease and the presence of complexing agents). Again, TESI must emphasis the range and complexity of characteristic wastes.

COMMENT NUMBER: 7-C-4
DOCKET NUMBER: LD12-00094
COMMENTER: TRICIL
ISSUE: Cadmium
SUBISSUE: Set standards at EP level
RESPONSE:

The commenter has claimed that high concentrations of oil, grease, and complexing agents may interfere with the stabilization process for D006 nonwastewaters. The Agency concurs that such problems could arise and points out that such problems can be minimized or avoided by pretreatment of D006 wastes which contain such constituents. For example, cadmium-bearing sludges containing complexing agents can sometimes be treated to convert the cadmium present to cadmium sulfide.

The Agency, however, realizes that such wastes may be more difficult to treat than most D006 nonwastewaters. For this reason, based on data received from Tricil and other commenters including those in the waste treatment and foundry industries, the Agency has decided to revoke the proposed treatment standards for D006 wastes. The new promulgated standards are 1.0 mg/l in the TCLP leachate for nonwastewater and 1.0 mg/l total composition for wastewater forms of D006. EPA also notes that this is a case for commercial treatment facility indicating that the wide variation of wastes in the characteristic waste codes precludes general achieveability of a standard significantly below the characteristic level.

Comment Number: 7-C-5
Docket Number: LD12-00097
Commenter: Aluminum Recycling Association
Issue: Cadmium
Subissue: Set standards at EP level
Comment:

Non-Migratory Nature of Secondary Aluminum Baghouse Dust

- Stricter treatment standards for secondary aluminum furnace and incineration-related baghouse dust is not required because it is well contained;

- It does not contaminate the environment at the point of generation since it is typically collected in bags and handled expeditiously, within 30 days;

- The secondary aluminum industry is not a storage facility (i.e., storage greater than 90 days). The furnace and incineration-related baghouse dust, where applicable, is disposed of at proper licensed landfills meeting the landfill criteria, including proper geology, leachate collection and treatment systems which prevent contamination from the landfill. In addition, a number of the landfills currently are combining furnace and incineration-related baghouse dust with other materials received to render them less hazardous to the environment;

- The quantity of furnace and incineration-related baghouse dust from secondary aluminum smelting operations is very small when compared to listed regulated hazardous waste from other industries. An estimate of the entire secondary aluminum industry is only 10,000 tons per year. This is insignificant when compared to such industries as the steel or chemical industries. In addition, secondary aluminum smelting furnace and incineration-related baghouse dust is not a listed hazardous waste as defined in 40 CFR 261.31 and 261.32.

COMMENT NUMBER: 7-C-5
DOCKET NUMBER: LD12-00097
COMMENTER: ALUMINUM RECYCLING ASSOCIATION
ISSUE: Cadmium
SUBISSUE: Set standards at EP level
RESPONSE:

In order for a waste to be exempted for the proposed regulations either it must be nonhazardous within the definition given in the regulation or a specific variance must be issued by the Agency. If the industry feels its waste has unique properties and problems, data should be supplied to the Agency as part of a variance petition. The Agency notes that it is clearly required to promulgate treatment standards for characteristic wastes.

In developing the proposed regulations, the Agency used data available at that time. Additional data was provided to the Agency by other commenters and after review of that information, the Agency has decided to set treatment standards at the characteristic level for D006 wastes.

Comment Number: 7-C-6
Docket Number: LD12-00117
Commenter: Exide
Issue: Cadmium
Subissue: Set standards at EP levels
Comment:

Proposed Treatment Standards for D006 Wastewater and Nonwastewater

Several wastes which are generated at Exide Corporation's facilities may be classified as EP toxic hazardous wastes based upon lead and/or cadmium concentrations. Thus, Exide Corporation is also concerned with EPA's proposed BDAT standards for D006 cadmium-containing wastes. (For wastewater, EPA has proposed treatment to achieve a total concentration of 0.20 mg Cd/l. For nonwastewater, EPA has proposed treatment (stabilization) to achieve 0.14 mg Cd/l for any single grab sample based upon the testing of TCLP leachate).

For the same reasons which have been outlined in previous discussions for D008 lead-containing wastes (e.g., EPA's reliance upon stabilization data from wastes other than those classified as D006, EPA's reliance upon a limited set of treatment data which are not necessarily representative of all D006 wastes, and EPA's questionable authority to specify treatment standards which are lower than the characteristic level), Exide Corporation believes that it is appropriate for EPA to set the BDAT treatment standard at the characteristic level of 1.0 mg Cd/l for D006 wastewater and nonwastewater.

Also for the same reasons outlined in the previous sections for D008 wastes, Exide Corporation believes that there is an insufficient number of commercially available stabilization facilities and an insufficient national capacity to ensure stabilization of all D006 wastes. Thus, Exide Corporation also requests that EPA grant a national capacity variance for D006 wastes until sufficient capacity has been developed.

COMMENT NUMBER: 7-C-6
DOCKET NUMBER: LD12-00117
COMMENTER: EXIDE CORPORATION
ISSUE: Cadmium
SUBISSUE: Set standards at EP level
RESPONSE:

The Agency has reviewed all of the data submitted by commenters and has decided not to promulgate the proposed treatment standards of 0.14 mg/l cadmium for nonwastewaters and of 0.20 mg/l cadmium for wastewater forms of D006. The Agency realizes that wastes classified as D006 can be generated in a wide variety of forms. The Agency is promulgating treatment standards at the characteristic level of 1.0 mg/l cadmium for nonwastewaters as measured by the TCLP and 1.0 mg/l for wastewaters as measured on a total composition basis.

Comment Number: 7-C-7
Docket Number: LD12-00143
Commenter: General Motors Corporation
Issue: Arsenic / Selenium
Subissue: Scrubbers to control arsenic emissions from incinerators
Comment:

Proposed Treatment Standards for Cadmium

EPA has stated that "The Agency has data on the stabilization of nonwastewaters indicating that cadmium can be effectively stabilized to levels below the characteristic level" (page 48436). We fail to see sufficient justification for proposing a treatment standard for D006 wastewaters of 0.20 mg/l, and a D006 nonwastewater treatment standard of 0.14 mg/l. As stated previously, we cannot agree with establishing a standard merely on the basis of it being technically achievable ("treatment for treatment's sake"), without any regard to whether it is economically feasible or necessary for protection of public health and the environment.

We therefore recommend that the treatment standards for both cadmium D006 wastewaters and nonwastewaters be established at the existing characteristic level (1.0 mg/l) as measured in the leachate generated in the EP Toxicity test.

Proposed Treatment Standard for Cadmium-Containing Batteries

By proposing a treatment standard of "Thermal recovery as method of treatment" (page 48436), EPA is apparently assuming that all nickel/cadmium batteries exceed the EP Toxicity limit of 1.0 mg/l (as measured in the leachate generated in the EP Toxicity test) for cadmium. Analyses performed by GM on some nickel/cadmium batteries show EP Toxicity levels below the 1.0 mg/l level.

GM therefore recommends that the treatment standard for cadmium D006 batteries be established at the existing characteristic level (1.0 mg/l) as measured in the leachate generated in the EP Toxicity test.

COMMENT NUMBER: 7-C-7
DOCKET NUMBER: LD12-00143
COMMENTER: GENERAL MOTORS
ISSUE: Cadmium
SUBISSUE: Set standards at EP level
RESPONSE:

The Agency has reviewed all of the data submitted by commenters and has decided not to promulgate the proposed treatment standards of 0.14 mg/l cadmium for nonwastewaters and of 0.20 mg/l cadmium for wastewater forms of D006. The Agency realizes that wastes classified as D006 can be generated in a wide variety of forms. The Agency is promulgating treatment standards at the characteristic level of 1.0 mg/l cadmium for nonwastewaters as measured by the TCLP and 1.0 mg/l for wastewaters as measured on a total composition basis.

Under HSWA, EPA is required to set the standards or the best demonstrated available technology; therefore, the standards are based on concentration levels that are technically feasible to achieve and will substantially diminish the toxicity of the waste or its likelihood to migrate so that treats to human health and the environment are minimized. For this rule, EPA is not required to determine the technology that is also the best in terms of economics. The Agency notes that it is not setting treatment standards for treament sake, nor do the characteristic levels define endpoints where no further minimization of threats is desirable.

By proposing and promulgating a treatment standard of "Thermal Recovery" for cadmium-containing batteries, EPA is not assuming that all batteries exceed the EP Toxicity Limit of 1.0 mg/l. Only cadmium-containing batteries which exceed the characteristic level and are therefore hazardous waste need to be treated using thermal recovery.

Comment Number: 7-C-8
Docket Number: LD12-00198
Commenter: Department of Energy
Issue: Cadmium
Subissue: Set standards at EP level
Comment:

8) **54 FR 48429, Development of Treatment Standards for EP Toxic Characteristic Metal Wastes.**

EPA is proposing treatment standards for the characteristic metals expressed as concentration-based standards or as required methods of treatment. DOE supports the establishment of treatment standards as specified methods of treatment for EP Toxic metal waste subcategories, where such an approach is clearly applicable. However, with respect to concentration-based treatment standards, DOE urges that such treatment standards relative to EP Toxic metal RMW be set at the characteristic level concentrations and that stabilization by solidification be considered an acceptable method of treatment to achieve these levels.

Along with the comments provided herein, DOE is resubmitting a data package to EPA describing a stabilization process to treat certain hazardous and mixed waste streams which contain the metals chromium (D007), lead (D008), cadmium (D006), and silver (D011). This data package, previously submitted on September 26, 1989, describes a solidification method of treatment that results in a stable waste form that will achieve levels below EP Toxic metal concentrations (i.e., performance data indicates that this stabilization process brings the RMW below characteristic levels for the EP Toxic metals identified above).

The data package discussed under this comment is separate from, and should not be confused with, the data package on the low-level RMW fraction generated from the pretreatment of high-level RMW streams. In that pretreatment process the low-level RMW fraction is separated from the high-level RMW fraction and then is sent to a grout solidification facility. This grout solidification data package was previously included as part of the December 22, 1989, submission.

With consideration to the stabilization data package being resubmitted with these comments, DOE requests that EPA evaluate the establishment of separate RMW subcategories specific to each metal (i.e. radioactive chromium subcategory), and establish the hazardous characteristic level as the concentration-based treatment standard, or specified methods of treatment (where applicable), for RMW.

COMMENT NUMBER: 7-C-8
DOCKET NUMBER: LD12-00198
COMMENTER: DEPARTMENT OF ENERGY
ISSUE: Cadmium
SUBISSUE: Set standards at EP level
RESPONSE:

The Hazardous and Solid Waste Amendments of 1986 (HWSA) require the Agency to establish technology-based treatment standards for hazardous wastes. Numerical values of these may differ from the health-based numbers used to define EP toxicity levels for individual metals. The Agency originally proposed technology-based standards for cadmium and encouraged commenters to submit additional treatment data.

The Agency appreciates the receipt of treatment data on simulated wastes from the Department of Energy and has reviewed this information carefully in considering revisions of proposed treatment standards. After consideration of all additional data received, the Agency has decided to set treatment standards for D006 wastes at the characteristic level in recognition of the fact that some wastes may be more difficult to treat than those for which the Agency had data at the time of proposal.

The Agency notes that the data submitted exhibited poor reproducibility and hence could not be used for development of treatment standards because of the very high variability factors calculated from the data set.

1

Comment Number: 7-C-9

Docket Number: LD12-00222

Commenter: American Foundrymen's Society

Issue: Cadmium

Subissue: Set standards at EP levels

Comment:

2. **Treatment standards for wastes generated by foundries should be set at the characteristic level. By EPA's own estimate, there is no significant reduction of risk to human health at the proposed levels when compared to the risk at the characteristic level.**

Comment Number: 7-C-9 continued
Docket Number: LD12-00222
Commenter: American Foundrymen's Society
Issue: Cadmium
Subissue: set Standards at EP levels
Comment:

2. Treatment Standard Should Be Set At Characteristic Level

The Agency's analysis of the health benefits of the proposed treatment standards for D006 and D008 does not warrant setting treatment levels lower than the existing characteristic level. Of the 148 reduced cancer cases the Agency estimates as human health benefit from the proposed regulation, less than one is from the treatment standard for lead and less than one is from the treatment standard for cadmium. In addition, of the 34,721 people whom the Agency believes will be removed from exposure above reference doses, none of them will experience any change in their exposure to lead and less than one tenth of one percent of them will experience any change in their exposure to cadmium. The proposed treatment standards for lead and cadmium essentially provide little or no added benefit to human health when compared to the existing characteristic levels.

The present standard for EP toxicity for lead is 5.0 mg/l, and for cadmium it is 1.0 mg/l. These standards are adequate, and the proposed land ban regulations do not warrant the proposed standard of 0.51 mg/l for lead and 0.14 mg/l for cadmium. The proposed regulation states that if a generator exceeds 5.0 mg/l for lead or 1.0 mg/l for cadmium, then the generator must treat to the reduced levels as stated in the proposal. However, if the generator is able to treat within the process and the end result is a waste that is less than 5.0 mg/l for lead or 1.0 mg/l for cadmium, then no additional treatment is necessary.

Since the treatment process for a waste treated before collection and one treated after may be the same, and the only difference between the two treated wastes is the point of addition, it is inconsistent that one of the wastes can be disposed as a non-hazardous waste while the other waste cannot be disposed without further treatment.

In Section 1 of this letter the physical differences between foundry and electroplating wastes were noted. Not every foundry waste stream will fit the above scenario; there are different waste stream sources within the foundry industry. The uniformity of the electroplating waste may have made consistent treatment possible.

However, it was clearly identified in the December 21, 1989 submission by RMT, Inc., that consistent lead and cadmium levels cannot be met for foundry wastes when attempting to achieve the proposed treatment standards.

COMMENT NUMBER: 7-C-9

DOCKET NUMBER: LD12-00222

COMMENTER: AMERICAN FOUNDRYMANS ASSOCIATION

ISSUE: Cadmium

SUBISSUE: Set standards at EP level

RESPONSE:

Under HSWA, the Agency is required to set treatment levels or methods of treatment which substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that threats to human health and the environment are minimized.

The Agency has reviewed all of the data submitted by commenters and has decided not to promulgate the proposed treatment standards of 0.14 mg/l cadmium for nonwastewaters and of 0.20 mg/l cadmium for wastewater forms of D006. The Agency realizes that wastes classified as D006 can be generated in a wide variety of forms. The Agency is promulgating treatment standards at the characteristic level of 1.0 mg/l cadmium for nonwastewaters as measured by the TCLP and 1.0 mg/l for wastewaters as measured on a total composition basis.

The Agency further notes that the difficulties the commenter had in treating lead and cadmium in the same wastes. This is one reason EPA is technically unsure that treatment of characteristic wastes is typically achieveable to below characteristic levels.

Comment Number: 7-C-10
Docket Number: L012-00100
Commenter: Prather, Seeger, Doolittle + Farmer
Issue: Cadmium
Subissue: Set standards at EP level
Comment:

A. **EPA Cannot Require Waste Treatment Beyond That Necessary To Ensure That The Waste Is Not Hazardous Under EPA's Regulations**

EPA is considering a treatment standard for cadmium-bearing wastes of 1.0 mg/l, the cadmium level in EPA's hazardous waste toxicity test. In the alternative, however, the agency proposes standards below the cadmium toxicity characteristic. The Cadmium Council urges adoption of the 1.0 mg/l standard and submits that EPA has no authority to require treatment to a lower level.

EPA's alternative proposal is based on RCRA Section 3004(m), which governs establishment of standards for treatment of hazardous waste prior to land disposal. EPA recognizes the "legal argument" that "Section 3004(m) applies only to wastes

> that are hazardous, and by EPA's regulations wastes that no longer exhibit a characteristic are not hazardous wastes" (54 Fed. Reg. 48490). Nevertheless, the contrary proposal is justified as "the most literal reading of Section 3004(m)" (id.).

Comment Number: 7-C-10-(Continued)
Docket Number: L012-00100
Commenter: Prather, Seeger, Doolittle + Farmer
Issue: Cadmium
Subissue: Set Standard at EP level
Comment:

EPA's interpretation of Section 3004(m) lets the tail wag the dog. Section 3004(m) does not, by its own terms, allow EPA to require treatment of nonhazardous waste. More importantly, it is only a relatively minor provision of an entire statutory subtitle for regulation of hazardous waste (RCRA Subtitle C), all of which depends expressly on EPA's regulations for identifying hazardous waste. Under RCRA Section 3001(b)(1), only those wastes identified as hazardous pursuant to EPA's regulations "shall be subject to the provisions of this subtitle [C]." Section 3004(a), which provides general authority for regulation of treatment, storage or disposal facilities, applies only to "hazardous waste identified or listed under this subtitle."

The land disposal provisions in Section 3004 similarly apply only to waste listed or identified as hazardous under EPA's regulations. Section 3004(g)(4) requires EPA to make a land disposal determination only for "all such listed wastes and for all hazardous wastes identified under Section 3001." Section 3004(g)(5), which imposes the land disposal prohibition, applies only "for as long as the waste remains hazardous." The statutory

Comment Number: 7-C-10 (continued)
Docket Number: LD12-00100
Commenter: Prather, Seeger, Doolittle + Farmer
Issue: Cadmium
Subissue: Set standards at EP level
Comment:

"hammers" in Section 3004(g)(6) apply only to "hazardous waste." Nothing in Section 3004(m), which governs treatment standards, contradicts this statutory scheme. The only requirement of Section 3004(m) is that treatment standards must "substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that short-term and long-term threats to human health and the environment are minimized." This is a far cry from authority to regulate waste that would not otherwise be subject to subtitle C, and there is no "literal interpretation" under which such authority can be gleaned.

The legislative history of the land disposal provisions likewise supports limitation of treatment standards to the constituent levels specified in EPA's hazardous characteristics tests. The relevant Committee reports mention only treatment of hazardous waste, and give no indication of any authority to require treatment below the hazardous characteristic levels.[1] Furthermore, the House Report specifically endorses use of characteristic tests as a benchmark for the land disposal prohibition:

> "EPA could also develop a set of characteristic tests along the lines of those used for determining whether the waste is hazar-

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[1] See H.R. Rep. No. 198, 98th Cong., 2d Sess. 31 (1984) (House Report); H.R. Rep. No. 1133, 98th Cong., 2d Sess. 80, 82 (Conference Report).

Comment Number: 7-C-10 (continued)
Docket Number: L012-00100
Commenter: Prather, Seeger, Doolittle + Farmer
Issue: Cadmium
Subissue: Set Standards at EP Level
Comment:

> dous in order to determine whether a waste should be banned from land disposal. These characteristic tests would presumably measure toxicity, persistence, mobility, and/or propensity to bioaccumulate" (House Report at 33).

The Report also indicates that any special tests for purposes of the land disposal ban would include concentration limits above, not below, those in EPA's tests for identifying hazardous waste. For example, in discussing the statutory concentration limits for California List wastes, the Committee was "satisfied that these levels are a reasonable regulatory starting point and, at levels 10,000 times the National Primary Drinking Water Standards, are conservative" (House Report at 35). The California List levels in the statute are 100 times the concentration levels in EPA's waste toxicity test, which sets the concentration level at 100 times the applicable drinking water standard.

Comment Number: 7 - C - 10 (continued)
Docket Number: L012 - 00100
Commenter: Pratten, Seeger, Doolittle + Farmer
Issue: Cadmium
Subissue: Set standards at EP level
Comment:

EPA has stated a concern that "the EP toxicants concentrations are levels at which a waste clearly presents a substantial hazard, and that the lower levels also may pose a hazard" (54 Fed. Reg. 48490). This ignores the fact that after a waste is treated to meet an applicable standard, if it remains hazardous it still must be deposited in a subtitle C facility designed essentially to permit no migration of hazardous constituents. If it is not hazardous, it must be placed in a subtitle D facility subject to such restrictions as Congress deemed necessary for nonhazardous wastes. EPA's proposal to require treatment below characteristic levels essentially reads subtitle D out of the Act and imposes the hazardous waste regulatory regime on nonhazardous wastes. There is no legal basis for such a proposal and EPA should abandon it.

COMMENT NUMBER: 7-C-10

DOCKET NUMBER: LD12-00100

COMMENTER: CADMIUM COUNCIL

ISSUE: Cadmium

SUBISSUE: No authority to set levels below EP TOX

RESPONSE:

Under HSWA the Agency is required to set treatment levels or methods of treatment which substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that threats to human health and the environment are minimized. The Agency is also authorized to set these standards based on the use of best demonstrated available technologies.

The Agency notes that it is not setting treatment standards for treatment's sake, nor do characteristic levels define the end points where no further minimization of threats is desirable.

Comment Number: 7-D-1
Docket Number: LD12-00078
Commenter: Glass Packaging Institute
Issue: Cadmium
Subissue: Set treatment method instead of level
Comment:

These comments demonstrate the danger of imposing specific treatment limits on D006, D007 and D008 waste based on transfer of performance data from other wastes containing these metals. Stabilization may indeed decrease the leachability of chromium, cadmium, and lead in flue slag and refractory brick. However, no empirical evidence exists for concluding that these levels will be (1) below the characteristic levels for these metals, or (2) an order of magnitude below these levels, as required under the proposed rule. Therefore, for characteristic wastes for which EPA lacks any stabilization data, but nonetheless believes that stabilization will minimize leaching of metals, EPA should prescribe a method of treatment (*i.e.*, stabilization) rather than a treatment level. This suggestion is similar to the alternative approach EPA is considering for D006 waste.

Comment Number: 7-D-Continued
Docket Number: LD12-00078
Commenter: Glass Packaging Institute
Issue: Cadmium
Subissue: Set treatment method instead of level
Comment:

Regarding flue slag, if EPA rejects GPI's suggestion to promulgate the method of stabilization rather than specific stabilization-based treatment limits for chromium-, cadmium-, and lead-containing wastes, GPI urges EPA to establish a generic treatment variance from these limits for high-sulfate containing wastes. Again, although GPI's stabilization data on this waste will not be available until February, in light of EPA's finding that sulfates reduce the dimensional stability of the cured matrix, it is predictable that flue slag and other high sulfate-containing wastes cannot be stabilized to achieve the proposed BDAT limits.

Rather than rely on site-specific treatability variances for this waste, a generic variance is needed to provide the inevitable regulatory relief that will be required from the final rule. Not only would EPA need to devote substantial resources to process individual variances, but of greater importance, until the variances are granted, generators of these wastes cannot dispose of them. This in turn will lead to the stockpiling of these wastes, which itself is problematic given the prohibition on storing such wastes (40 C.F.R. § 268.50) for purposes other than facilitating treatment. Consequently, if EPA promulgates treatment levels for D006-D008, a generic variance from these levels should be promulgated for high-sulfate containing wastes.

COMMENT NUMBER: 7-D-1
DOCKET NUMBER: LD12-00 78
COMMENTER: GLASS PACKAGING INSTITUTE
ISSUE: Cadmium
SUBISSUE: Set treatment method instead of level (Glass Packaging Institute)

RESPONSE:

Under HSWA, the Agency is required to set treatment levels or methods of treatment which substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that threats to human health and the environment are minimized.

The Agency has reviewed all of the data submitted by commenters and has decided not to promulgate the proposed treatment standards of 0.14 mg/l cadmium for nonwastewaters and of 0.20 mg/l cadmium for wastewater forms of D006. The Agency realizes that wastes classified as D006 can be generated in a wide variety of forms. The Agency is promulgating treatment standards at the characteristic level of 1.0 mg/l cadmium for nonwastewaters as measured by the TCLP and 1.0 mg/l for wastewaters as measured on a total composition basis.

If the commenter feels the wastes of his industry cannot meet the proposed treatment standards, data should be submitted to the Agency to verify this point. Treatment standards for processes which do not recover hazardous constituents must be specific in order to insure that wastes are being properly managed.

In order to grant a generic variance, the Agency needs to examine data showing that a specific waste or class of wastes present unique treatment problems. The commenters description of their waste indicates

COMMENT NUMBER: 7-D-1 (continued)

DOCKET NUMBER: LD12-00 78

COMMENTER: GLASS PACKAGING INSTITUTE

ISSUE: Cadmium

SUBISSUE: Set treatment method instead of level (Glass Packaging Institute)

RESPONSE:

that it is high in sodium sulfate salts which interfere with the stabilization process. This demonstrates that pretreatment of the waste may be needed to remove the sulfates. Leaching processes would solubilize the sulfate and the leachate could then be treated by chemical precipitation to yield a hydroxide on sulfide sludge which, along with the solid residue from the leaching process should be amenable to stabilization. If the commenter has such data showing such alternatives are also not successful, he is urged to submit them for the Agency's consideration.

Comment Number: 7-H-1
Docket Number: LD12-00049
Commenter: RMT, Inc.
Issue: Cadmium
Subissue: Foundry wastes cannot meet standards
Comment:

RMT has investigated treatment for a number of foundries, both iron and brass, as well as EP-Toxic wastes from other industries. These studies have shown that no one process is effective for all EP-Toxic wastes (for lead and cadmium). What works for one foundry's waste may not work on the next foundry's waste. There are a number of independent variables that may affect the release of lead and cadmium in an EP Toxicity test, variables that are difficult to predict and that may have significant impacts on treatment effectiveness of a given additive.

For example, phosphate addition has been found to be effective at lowering both lead and cadmium leaching from some foundry wastes to levels well below the EP Toxicity test criteria (e.g., Foundries A and B, Table 1). However, for Foundry C, phosphate was not effective at consistently reducing cadmium to below EP-Toxic levels. Furthermore, on a given waste stream, treatment at a designated dosage can result in highly variable results over time, as discussed in Section 5 below.

Use of cement as a treatment additive has not proven consistently effective for all foundry wastes (Table 2). Use of cement at dosages of 15, 20, and 25 percent (by weight) did not reduce lead to below the EP Toxicity test levels. A 30 percent dosage was effective at reducing lead to below the proposed criteria in an EP Toxicity test. However, the same waste sample treated at a 30 percent cement dosage leached lead at 26 mg/L in an EP water test. We feel that the water leach test more accurately reflects leaching conditions in a foundry waste monofill than does the EP Toxicity (or TCLP) test. Treatment of this waste with cement to lower leaching in the EP Toxicity test could possibly result in creating an environmental hazard where none before existed. If the EP water test more accurately reflects the leaching behavior of the treated waste, the leachate from the treated waste would be EP Toxic, due to the high dissolved lead content. The effect of treating this waste with cement is not to render the waste non-EP-Toxic, but rather to shift the problem from an EP-Toxic solid waste to an EP-Toxic leachate under nonacidic leaching conditions.

Comment Number: 7-H-1
Docket Number: LD12-00049
Commenter: RMT
Issue: Cadmium
Subissue: foundry wastes cannot meet standards
Comment:

TABLE 1

PHOSPHATE TREATMENT OF FOUNDRY WASTES

	EP Toxicity Test Results	
	Cadmium	Lead
	mg/L	
FOUNDRY A		
Untreated	0.17	8.0
+1.0% Triple Superphosphate	-	0.47
+2.5% Triple Superphosphate		<0.06
+1.15% Phosphoric Acid	0.29	2.4
+1.5% Phosphoric Acid	0.28	1.3
+2.3% Phosphoric Acid	0.20	0.22
+3.46% Phosphoric Acid	0.13	<0.06
FOUNDRY B		
Untreated	6.9	180
+1% Phosphoric Acid	4.4	25
+2% Phosphoric Acid	2.7	12
+3% Phosphoric Acid	0.59	<0.06
FOUNDRY C		
Untreated	8.8	79
3.9% Phosphoric Acid	4.4	9.2
7.8% Phosphoric Acid	0.46	0.16
10% Phosphoric Acid	1.2	0.9
12.5% Phosphoric Acid	0.71	<0.1
20% Phosphoric Acid	3.8	0.4

Comment Number: 7-H-1
Docket Number: L012-00049
Commenter: RMT
Issue: Cadmium
Subissue: Foundry wastes cannot meet standard
Comment:

TABLE 2

TREATMENT OF EP-TOXIC FOUNDRY WASTE USING CEMENT

	EP Toxicity Test Results Cadmium	 Lead
	----------mg/L	--------
FOUNDRY C		
Untreated Composite EP-Toxic Waste	8.8	79.0
+20% Cement	3.0	12.0
+25% Cement	1.4	1.0
+30% Cement	<0.005	0.3

	EP Water Leach Test Results Cadmium	 Lead
	------------mg/L	---------
Untreated	(not tested)	
+20% Cement	<0.005	12
+25% Cement	(not tested)	
+30% Cement	<0.005	26

NOTE: A 20% dose is 80 grams of foundry waste and 20 grams of Portland cement. The sample was allowed to cure for 1 week, then was ground to pass a 9.5 mm sieve and subjected to an EP Toxicity test.

7-H-1

TABLE 3

FERROUS FOUNDRY EP-TOXIC WASTE TREATMENT TESTING RESULTS

	EP Toxicity Test Results	
	Cadmium	Lead
	-----------mg/L---------	
FOUNDRY C		
Untreated EP-Toxic Waste Composite	8.8	79
+25% Magnesium Hydroxide Slurry	1.7	5.2
+3.9% Phosphoric Acid	4.4	9.2
+7.8% Phosphoric Acid	0.46	0.16
+10% Phosphoric Acid	1.2	0.9
+12.5 Phosphoric Acid	0.71	<0.1
+20% Phosphoric Acid	3.8	0.4
+10% Metallic Iron	6.3	17
+20% Metallic Iron	3.1	0.57
+20% Cement -	3.0	12.0
+25% Cement	1.4	1.0
+30% Cement	<0.005	0.3
FOUNDRY D		
Sample #1 Untreated	5.2	88
+10% Metallic Iron	1.9	0.7
+20% Metallic Iron	0.35	0.1
+2.5% Phosphoric Acid	2.3	0.3
+5.0% Phosphoric Acid	1.0	<0.1
+7.5% Phosphoric Acid	0.48	<0.1
+7.5% Magnesium Oxide	0.029	0.3
+15% Magnesium Oxide	0.014	0.9
+22.5% Magnesium Oxide	0.005	1.4
Sample #2 Untreated	9.80	85.1
+7.5% Triple Superphosphate	2.70	0.34
+10% Triple Superphosphate	1.07	0.11
+12.5% Triple Superphosphate	0.77	0.15
+15.0% Triple Superphosphate	0.68	<0.1
+20.0% Triple Superphosphate	0.43	<0.1
+10% Phosphoric Acid	1.2	<0.1
+15% Phosphoric Acid	4.0	<0.1
+5% Magnesium Oxide + 5% TSP	2.3	0.2
Proposed BDAT (TCLP)	0.14	0.51
EP Toxicity Criteria	1.0	5.0

738.03 101:MSD:usepa

COMMENT NUMBER: 7-H-1

DOCKET NUMBER: LD12-00049

COMMENTER: RMT INC.

ISSUE: Cadmium

SUBISSUE: Foundry wastes cannot meet standards

RESPONSE:

The Agency has reviewed all of the data submitted by commenters and has decided not to promulgate the proposed treatment standards of 0.14 mg/l cadmium for nonwastewaters and of 0.20 mg/l cadmium for wastewater forms of D006. These data showed substantial treatment variability even within wastes from the same industry. Even without calculating variability factors, these data indicate that there are some problems in treating both lead and cadmium simultaneously to values much lower than characteristic levels. Similar concerns have been expressed by two commercial treatment firms regarding interferences in treatment of several characteristic metals at one time which may be present in non-foundry D006 wastes. The Agency realizes that wastes classified as D006 can be generated in a wide variety of forms. The Agency is promulgating treatment standards at the characteristic level of 1.0 mg/l cadmium for nonwastewaters as measured by the TCLP and 1.0 mg/l for wastewaters as measured on a total composition basis.

The Agency has also reviewed the commenter's suggestion that a water leach test be considered as accurately reflecting the leachability of wastes. Water leaching is not viewed by the Agency as a valid test for determining if a waste has the characteristic of EP toxicity. In developing its original regulations, the Agency considered the issues of leachability and specified a specific test as the standard to use. However, commenters can request the Administrator to consider revisions to the existing acid leaching test procedures required under 40 CFR Part 261.24 and Part 268, Appendix 1, under provisions set forth in Parts 260.20 and 260.21.

Comment Number: 7-1-1-2
Docket Number: LD12-0051
Commenter: American Cast Metals Association
Issue: Cadmium
Subissue: Foundry wastes cannot meet standards
Comment:

Treatment of foundry waste containing lead or cadmium with the stabilization technique applicable to the other industries' waste streams does not result in EP and TCLP levels consistently below the proposed treatment standard for non-wastewater waste. This, of course, defeats the only meaningful reason for creating such industry or waste groupings. Please refer to the AFS submission for further supporting data regarding the ineffectiveness of F006 (Electroplating wastewater treatment sludge) and K046 (Explosive manufacturing waste) treatment technology for foundry waste containing lead and/or cadmium.

COMMENT NUMBER: 7-H-2
DOCKET NUMBER: LD12-00051
COMMENTER: AMERICAN CAST METALS ASSOCIATION
ISSUE: Cadmium
SUBISSUE: Foundry wastes cannot meet standards
RESPONSE:

The commenter has provided data to partially support their contention of being unable to meet the proposed standards. The data do show the variability of foundry wastes and the inapplicability of any single stabilization mixture to all types of foundry D006 wastes. However, other commenters have submitted data showing that foundry wastes may be treated by stabilization if care is taken to select stabilizing mixtures appropriate to the given wastes. This approach was shown to be viable even when lead and cadmium were both present. In general, the data received have shown that cadmium levels in EP leachates from stabilized foundry wastes can be reduced to below 0.8 mg/l cadmium. The Agency has examined all of this data and has decided to set the treatment level for D006 nonwastewaters at the characteristic level of 1.0 mg/l as measured in the TCLP leachate and 1.0 mg/l for D006 wastewaters.

Comment Number: 7-H-3
Docket Number: LD12-00097
Commenter: Aluminum Recycling Association
Issue: Cadmium
Subissue: Foundry wastes cannot meet standards
Comment:

Criticality of the Secondary Aluminum Industry to the Automotive Sectors and to the Environment

- The proposed standards, if adopted, will seriously curtail the secondary aluminum industry's activities as a major contributor to the nation's economic and environmental well-being.

  Secondary aluminum smelters, in order to comply with EPA regulations, operate with baghouses that collect materials containing lead, cadmium, and chromium. If these companies can no longer operate with baghouses because of the new proposed landfill regulations, then on several environmental counts they would be forced to shut down;

- Secondary aluminum smelters provide critical castings as components to the automotive, consumer, and defense industries;

- As critically, secondary aluminum smelters recycle vast amounts of aluminum scrap: they collect, remelt and alloy new and old scrap to generate specification ingot. Over 1,800,000,000 pounds of such scrap is thus annually consumed which would otherwise be left in the environment as unused waste;

- Consequently, the imposition of unattainable treatment standards upon the industry will likely lead to plant cutbacks and closings. This situation will, in turn, lead to shortages in castings and, therefore, higher prices within the automotive industries and, more importantly, a build-up of unused aluminum scrap within the environment.

COMMENT NUMBER: 7-H-3

DOCKET NUMBER: LD12-00097

COMMENTER: ALUMINUM RECYCLING ASSOCIATION

ISSUE: Cadmium

SUBISSUE: Foundry wastes cannot meet standards

RESPONSE:

Under HSWA, the Agency is required to set treatment levels or methods of treatment which substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that threats to human health and the environment are minimized.

The Agency has reviewed all of the data submitted by commenters and has decided not to promulgate the proposed treatment standards of 0.14 mg/l cadmium for nonwastewaters and of 0.20 mg/l cadmium for wastewater forms of D006. The Agency realizes that wastes classified as D006 can be generated in a wide variety of forms. The Agency is promulgating treatment standards at the characteristic level of 1.0 mg/l cadmium for nonwastewaters as measured by the TCLP and 1.0 mg/l for wastewaters as measured on a total composition basis.

The Agency recognizes that there may exist unique wastes that cannot be treated to the level specified as the revised treatment standards. In such cases, generators or owners/operators may submit a petition to the Administrator requesting a variance from the treatment standard. A particular waste may be significantly different from the wastes considered in establishing treatability groups because the waste contains a more complex matrix which makes it more difficult to treat.

Variance petitions must demonstrate that the treatment standard established for a given waste cannot be met. This demonstration can be made by showing that attempts to treat the waste by available

COMMENT NUMBER: 7-H-3 (continued)
DOCKET NUMBER: LD12-00097
COMMENTER: ALUMINUM RECYCLING ASSOCIATION
ISSUE: Cadmium
SUBISSUE: Foundry wastes cannot meet standards
RESPONSE:

technologies were not successful, or through appropriate analysis of the waste which demonstrate that the waste cannot be treated to the specified levels. Variances will not be granted on a showing that adequate BDAT treatment capacity is unavailable. (Such demonstrations can be made according to the provisions in 40 CFR 268.5 for case-by-case extensions of the effective date.) The Agency will consider granting generic petitions provided that representative data are submitted to support a variance for each facility covered by the petition. For additional information on the submittal of variances from the treatment standards, the commenter is referred to the document entitled "Methodology for Developing Best Demonstrated Available Treatment (BDAT) Standards"; EPA/530-SW-89-017L, published December 1988.

Comment Number: 7-H-4
Docket Number: LD12-00104
Commenter: The Wheland Foundry
Issue: Cadmium
Subissue: Foundry wastes cannot meet standards
Comment:

Wheland Foundry has been investigating treatment methods on its cupola emission control baghouse dust. Results of bench-scale testing have shown that no process (of those tested) consistently reduces ~~lead~~ and cadmium to below the proposed criteria, although there are methods that will reduce lead and cadmium to below the EP Toxicity level (Table 1). Only one treatment additive and dosage (7.5 percent magnesium oxide) on one sample reduced both lead and cadmium to below the proposed treatment criteria. However, it is unlikely that this level of treatment could be consistently reached given the variability in the waste and the difficulty of obtaining consistently thorough mixing in the field. Also, the addition of magnesium oxide to the waste increased lead leaching in a water leach test to 0.4 mg/L, a value which is of concern to us. Cement was not tested on this waste for two reasons. First, previous work using cement by our consultant has shown that cement does not consistently treat foundry emission control wastes to below EP Toxicity criteria. Second, and more important, it has been found that cement-treated foundry wastes will leach lead at concentrations over 1 mg/L in a water leach test (e.g., an EP Water Test). The water leach test is a more realistic simulation of the leaching environment that our waste is exposed to than is an acid leach test. Treatment of our waste with cement and on-site disposal could then cause an environmental problem where none would otherwise exist.

COMMENT NUMBER: 7-H-4
DOCKET NUMBER: LD12-00104
COMMENTER: THE WHELAND FOUNDRY
ISSUE: Cadmium
SUBISSUE: Foundry wastes cannot meet standards
RESPONSE:

Several facilities from the foundry industry have submitted comments claiming that they cannot treat their D006 wastes to the 0.14 mg/l cadmium; as measured by TCLP, for nonwastewaters or of 0.2 mg/l cadmium for wastewaters. However, some commenters submitted data showing that available stabilization methods can treat their wastes to levels on or about the characteristic level of 1.0 mg/l cadmium. These commenters included a few foundries whose data showed the same general trends as those from other industries. As a result of these data, EPA is withdrawing the proposed cadmium levels of 0.14 mg/l, nonwastewaters, and, 0.20 mg/l, wastewaters. EPA is, instead, promulgating treatment standards at the characteristic level of 1.0 mg/l cadmium for D006. (Compliance with the 1.0 mg/l cadmium treatment standards must be measured by the TCLP extract in D006 nonwastewaters; see FR 55, (61), 11798, March 29, 1990.)

The Agency has also reviewed the commenter's suggestion that a water leach test be considered as accurately reflecting the leachability of wastes. Water leaching is not viewed by the Agency as a valid test for determining if a waste has the characteristic of EP toxicity. In developing its original regulations, the Agency considered the issues of leachability and specified a specific test as the standard to use. However, commenters can request the Administrator to consider revisions to the existing acid leaching test procedures required under 40 CFR Part 261.24 and Part 268, Appendix 1, under provisions set forth in Parts 260.20 and 260.21.

Comment Number: 7-H-5
Docket Number: LD12-00049.
Commenter: RMT
Issue: Cadmium
Subissue: Foundry Wastes Cannot Meet Standard
Comment:

Many foundries dispose their waste in foundry waste monofills. In these landfills, the pH of the leaching solution to which the wastes are exposed is usually in the slightly basic range (pH values of 7 to 9). Leachates from water leach tests on EP-Toxic foundry wastes also usually have pH values in the slightly basic range (AFS paper 81-149), although some wastes may have slightly acidic pH values. The water leach test provides a better representation of the leaching character of a foundry waste monofill than does the EP Toxicity test. RMT has worked with numerous foundries evaluating the impact of their waste on ground water, and has not found any cases where the disposal of emission control waste has resulted in lead or cadmium contamination of ground water outside of the landfill. These wastes, as disposed in monofills, do not appear to cause ground water contamination. It would be a grave mistake to treat these wastes to eliminate a regulatory problem (i.e., being classified as EP-Toxic) and, at the same time, create a potential environmental problem due to the enhanced leaching of lead.

COMMENT NUMBER: 7-H-5
DOCKET NUMBER: LD12-00049
COMMENTER: RMT INC.
ISSUE: Cadmium
SUBISSUE: Foundry wastes cannot meet standards
RESPONSE:

Several foundry industry commenters pointed out that the existing acid leaching test procedures (TCLP and EPTOX) applicable to their wastes should be replaced with a water leach test. These commenters believe the water leach test provides a better representation of the leaching character of a foundry waste monofill than does the EP Toxicity test. At this time, the Agency is not making an determinations on the commenters claims that their water characteristic leaching tests are more representative for foundry wastes than the existing acid leaching test procedures. However, the commenters can request the Administrator to consider revisions to the existing acid leaching test procedures required in 40 CFR Part 261.24 and Part 268, Appendix I, under the provisions set forth in Parts 260.20 and 260.21.

Comment Number: 7-H-6

Docket Number: LD12-00049

Commenter: RMT, Inc.

Issue: Cadmium

Subissue: Foundry wastes cannot meet standards

Comment:

Of the additives that RMT routinely tests for treating foundry wastes, we have not found any that will consistently lower lead and cadmium to below the proposed criteria. Table 3 presents two examples of bench-scale treatment of a variety of additives on foundry wastes. Also, we are not aware of-other treatment technologies that can consistently reduce lead and cadmium leaching to below the proposed levels without posing the risk of elevated metals leaching in nonacidic environments. Therefore, we feel that the proposed criteria may result in foundries being unable to safely treat or dispose of their waste. Since iron and brass foundries are important industries that generate a large total volume of EP-Toxic waste, the difficulty of treating or disposing these wastes could cause serious problems.

COMMENT NUMBER: 7-H-6

DOCKET NUMBER: LD12-00049

COMMENTER: RMT INC.

ISSUE: Cadmium

SUBISSUE: Foundry wastes cannot meet standards

RESPONSE:

Several facilities from the foundry industry have submitted comments claiming that they cannot treat their D006 wastes to the 0.14 mg/l cadmium; as measured by TCLP, for nonwastewaters or of 0.2 mg/l cadmium for wastewaters. However, some commenters submitted data showing that available stabilization methods can treat their wastes to levels on or about the characteristic level of 1.0 mg/l cadmium. Similar concerns were expressed by two commercial waste treatment facilities which indicated that due to wide variations in compositions of characteristic wastes, it is difficult to universally treat all characteristic wastes to well below characteristic levels. As a result of these data, EPA is withdrawing the proposed cadmium levels of 0.14 mg/l, nonwastewaters, and, 0.20 mg/l, wastewaters. EPA is, instead, promulgating treatment standards at the characteristic level of 1.0 mg/l cadmium for D006. (Compliance with the 1.0 mg/l cadmium treatment standards must be measured by the TCLP extract in D006 nonwastewaters; see FR 55, (61), 11798, March 29, 1990.)

Comment Number: 7-I-1
Docket Number: LD12-D0089
Commenter: Mill Service Inc.
Issue: Inconsistencies
Subissue: Cadmium
Comment:

Reagents - In several instances, EPA has requested comment on whether it should require the use of specific reagents as part of the treatment standard. From the discussions in Section III.A of the proposed rule, we believe that EPA has determined that it is in the best interest of all parties to establish concentration-based treatment standards based on the best demonstrated available technology wherever possible and then to allow the regulated community to choose the treatment technology they wish to implement to achieve the standards. Specification of the reagents to be used in a particular treatment standard is a departure from that practice and counter to the reasoning behind it.

COMMENT NUMBER: 7-I-1
DOCKET NUMBER: LD12-00089
COMMENTER: MILL SERVICE INC.
ISSUE: Cadmium
SUBISSUE: Inconsistencies in setting standards
RESPONSE:

The Agency is promulgating a treatment standard at the characteristic level of 1.0 mg/l cadmium for nonwastewaters, as measured by TCLP, and 1.0 mg/l cadmium for wastewaters, as measured by total analysis. Any treatment methods (other than ion-permissible dilution or land disposal), capable of meeting the promulgated treatment standard may be used; therefore, the Agency is not specifying that any particular reagents be used.

Comment Number: 7-K-1
Docket Number: LD12-00069
Commenter: Institute of Scrap Recycling Industries
Issue: Cadmium
Subissue: Allowance of alternate technologies
Comment:

Appropriate Treatment Standards and Technologies

While thermal recovery of cadmium is an appropriate technology for treating cadmium containing batteries, we do not beleive it is the only possible appropriate technology for that purpose. The EPA's regulations should be flexible enough to permit alternative technologies to be used, provided they can achieve satisfactory results.

COMMENT NUMBER: 7-K-1
DOCKET NUMBER: LD12-00069
COMMENTER: RAYOVAC
ISSUE: Cadmium
SUBISSUE: Allowance of alternate technologies
RESPONSE:

EPA is setting thermal recovery technologies as the treatment standard for D006 wastes belonging to the cadmium-containing batteries subcategory. Although more than one technology may exist which can provide an equivalent treatment to the promulgated standard, the Agency lacks performance data on these alternatives. Todays standards, however, should not preclude facilities from seeking a variance from the treatment standard based on alternative technologies (see 40 CFR Part 268.42(b)).

Comment Number: 7-K-2
Docket Number: LD12-00269
Commenter: ASARCO
Issue: Cadmium
Subissue: Allowance of Alternative Technologies
Comment:

Cadmium

Lime with sulfide polishing is generally regarded as the best approach. Preferably only lime should be used to pH11. The allowable amount of sulfide ion in the effluent may restrict the use of this technology.

COMMENT NUMBER: 7-K-2
DOCKET NUMBER: LD12-00269
COMMENTER: ASARCO
ISSUE: Cadmium
SUBISSUE: Allowance of alternate technologies
RESPONSE:

At this time, the Agency is not promulgating a method of treatment for D006 wastewaters. The Agency is instead promulgating a treatment standard at the characteristic level of 1.0 mg/l, total constituent analysis for wastewater forms of D006 and 1.0 mg/l as measured in the TCLP leachate for D004 nonwastewaters. Any treatment (other than impermissible dilution or treatment defined as land disposal) capable of achieving this treatment standard may be used.

Comment Number: 7-L-1
Docket Number: LD12-00088
Commenter: Inco United States, Inc.
Issue: Cadmium
Subissue: Stepwise recovery of more than one constituent
Comment: may requires processing at more than one site.

Fourth, in designating thermal recovery as the treatment standard for nonwastewater forms of wastes exhibiting the characteristic of EP Toxicity for cadmium (*e.g.*, nickel-cadmium batteries), EPA should make clear that the thermal recovery need not occur in a single facility. This is a critical point, since many secondary materials contain a variety of recoverable metals (such as nickel and cadmium) that cannot all be recovered in the same thermal process and, therefore, are processed sequentially for recovery of different metals at separate facilities.

COMMENT NUMBER: 7-L-1

DOCKET NUMBER: LD12-00088

COMMENTER: INCO UNITED STATES INC.

ISSUE: Cadmium

SUBISSUE: Stepwise recovery of more than one constituent may require processing at more than one site

RESPONSE:

The proposed regulations for D006 wastes are based on thermal recovery as a method of treatment for the cadmium content of the wastes. They do not specify, however, that metals recovery operations all be conducted at a common site. The Agency realizes that some wastes, such as nickel cadmium batteries, spent catalysts, etc. may contain more than one recoverable constituent and that individual waste treatment operations may not be able to fully recover all valuable constituents at a single processing site. Processing at more than one facility may be needed to recover all materials of value.

Residues from the initial separation of battery components are no longer in the cadmium containing battery subcategory of D006 wastes. If the residues continue to exhibit the characteristic for cadmium, however, they would still be prohibited wastes in the D006 treatability group and would have to be treated to meet the standards for D006 wastes.

Comment Number: 7-M-1
Docket Number: L012-00218
Commenter: NEMA
Issue: Cadmium
Subissue: Most batteries are not hazardous wastes
Comment:

Finally, if used Ni-Cd household batteries were to be considered hazardous waste under RCRA, collection and shipment of used batteries for reclaiming purposes should have the same exemptions as the lead-acid batteries have as was discussed previously under industrial batteries.

NEMA is supporting a bill introduced on July 11, 1989 by Rep. George Hochbrueckner (H.R. 2853) entitled "Used Battery Recycling and Research Act of 1989." This bill has now been included in its entirety as Sec. 107 of H.R.3735 introduced November 19, 1989 by Representative Thomas A. Luken as an amendment of RCRA. In addition to requirements for the collection and recycling of used automobile lead-acid storage batteries, this bill:

1 - directs EPA to conduct a study on the effects of household dry-cell batteries on the environment and determine whether household batteries can or should be recycled;
2 - requires that EPA report to Congress on its findings regarding household batteries within one year after enactment of this Act.

We think such a study makes a lot of sense and any regulatory actions to be taken by EPA will be based upon the facts uncovered in a thorough, objective research program. Proposed EPA regulations for household cadmium batteries under "Land Disposal Restrictions for Third Scheduled Wastes" are therefore premature.

COMMENT NUMBER: 7-M-1
DOCKET NUMBER: LD12-00218
COMMENTER: NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)
ISSUE: Cadmium
SUBISSUE: Most batteries are not hazardous wastes
RESPONSE:

The commenter has raised two issues, i.e., are all cadmium batteries hazardous wastes and are battery containing wastes from household sources also considered hazardous wastes for the purpose of this rulemaking.

If specific batteries do not exhibit one or more of the characteristics for hazardous waste they do not require treatment as hazardous wastes.

Solid wastes generated by household sources are excluded from the definition of hazardous wastes by 40 CFR 261.4(b)(1). Furthermore, household sources would be expected to generate less than 100 kg/month of any hazardous waste, and hence are exempt from regulation as small quantity generators.

Comment Number: 7-M-2
Docket Number: LD12-00100.
Commenter: Prather, Seger, Doolittle, & Farmer
Issue: Cadmium
Subissue: Batteries not hazardous wastes
Comment:

B. EPA Cannot Regulate Nonhazardous Nickel-Cadmium Batteries In This Proceeding

EPA has proposed a treatment standard for nickel-cadmium batteries requiring "thermal recovery as a method of treatment" (54 Fed. Reg. 48436). This proposal erroneously assumes that used nickel-cadmium batteries are hazardous waste. In experience of Cadmium Council members, the majority of these batteries do not exhibit hazardous characteristics as a result of their structural integrity. Nor has EPA placed nickel-cadmium batteries on any of the agency's lists of hazardous wastes.

Under these circumstances, nonhazardous nickel-cadmium batteries cannot be regulated in this proceeding. Such regulation would amount to listing the batteries as hazardous waste without public participation and without consideration of EPA's criteria for waste listing, both clear violations of RCRA Section 3001(b) and EPA's listing regulations (40 CFR 261.11, 261.30). EPA's final rule should make it clear that neither the proposed treatment standard nor any other hazardous waste regulations apply to nickel-cadmium batteries that do not exhibit a hazardous characteristic.

COMMENT NUMBER: 7-M-2

DOCKET NUMBER: LD12-00100

COMMENTER: CADMIUM COUNCIL

ISSUE: Cadmium

SUBISSUE: Most batteries are not hazardous wastes

RESPONSE:

For a waste material to be a characteristically hazardous D006 waste it must exhibit the characteristic of EP toxicity for cadmium as defined in the EP toxicity tests as defined in 40 CFR 261.4. This test prescribes the methods to be used for evaluating leachates from the waste.

The Agency presently feels that many discarded cadmium batteries may exhibit the characteristic of EP toxicity with respect to cadmium. This, however, may have to be ascertained or a case-by-case basis. However, there may be some batteries which contain cadmium or its compounds and which do not exhibit the characteristic of EP toxicity for cadmium. If such batteries do not exhibit one or more of the characteristics of a hazardous waste, they do not require treatment as a hazardous waste.

Comment Number: 7-N-1
Docket Number: LD12-L0003
Commenter: RMT
Issue: Cadmium
Subissue: Data Submittal
Comment:

On December 21, 1989, I submitted a letter to you in response to the proposed treatment criteria for lead and cadmium EP-Toxic wastes (D006 and D008), given in the November 22, 1989, Federal Register. Included with the letter were three tables and two figures, containing data in support of my discussion on the proposed criteria.

This letter contains the laboratory QA/QC documentation for the data presented in the December 21 letter. Jim Berlow of the Office of Solid Waste, USEPA, stated in a telephone conversation that it was acceptable to submit the QA/QC documentation separately and after the letter.

A copy of the December 21 letter is enclosed in Attachment 1. The QA/QC documentation is presented in Attachment 2, organized according to the order in which the data were presented in the letter. Note that, in some cases, analytical data for several samples are presented on the same bench sheet. In such cases, the bench sheets are included with the first sample in the attachment.

A key to the QA/QC data is presented at the start of Attachment 2.

Chain-of-custody forms have not been submitted. Most of these samples were generated in the laboratory, and the chain-of-custody form does not tell much, since the form is generated in the laboratory. More importantly, we do not wish to identify our clients, and chain-of-custody forms would do so.

COMMENT NUMBER: 7-N-1
DOCKET NUMBER: LD12-00003
COMMENTER: RMT CORPORATION
ISSUE: Cadmium
SUBISSUE: Data
RESPONSE:

The Agency thanks RMT Corp. for its submittal of data on treatment of foundry wastes. The data shows that using various formulations specific D006 non wastewaters can be stabilized to yield TCLP leachates containing below 0.8 mg/l cadmium in their EPA leachates in many instances. As many as eight stabilization formulations containing phosphates or magnesium oxide were shown capable of achieving such a level with the wastes tested. The Agency feels this data clearly shows that stabilization mixes exist which will allow TCLP leachates from the stabilized foundry wastes to be below the characteristic level of 1.0 mg/l. Two commercial waste treatment facilities have expressed similar concerns about the ability to treat all D006 characteristic wastes to well below characteristic levels. The Agency has reviewed this data and has decided to set the treatment standard for nonwastewater at the characteristic level of 1.0 mg/l as determined by the TCLP procedure and 1.0 mg/l for D006 wastewaters.